Exhibit A

October 4, 2024

Tim Franz
City of Cornelius
1355 North Barlow Street
Cornelius, OR 97113

Subject: **Hwy 8 and 4th Chick-fil-A**

Dear City of Cornelius,

This letter serves as the applicant's (4G Development and Consulting, Inc.) written response to the completeness items identified in your incomplete letter, dated September 25, 2024, for the above referenced project located at the intersection of Highway 8 and 4th Street in Cornelius, Oregon.

I. Information Necessary to Complete Application

The following information must be submitted before your proposal can be evaluated:

1. ***On the Land Use application, please indicate all the associated tax lots for the proposed project. Only tax lot #2400 is identified, there are four more lots that need to be included on the application, tax lot #2500, #2600, #2700 and #3000.***

Response: Revised land use application has been prepared and reflects all associated tax lots for the proposed project. See Exhibit A).

2. ***Provide details of the proposed bicycle parking rack(s). Based upon the building size (4,855 SF) a total of 5 bicycle parking spaces are required. The narrative describes that 4 bicycle parking spaces will be provided. The bicycle parking spaces are required to comply with OAR 660-012-063(Bicycle Parking Requirements), as adopted by the State.***

Response: Bicycle parking has been increased to five spaces as required. A detail for the proposed bicycle parking has been included. See the revised Plan Set (Exhibit E) for further detail.

3. ***Provide details of the proposed trash enclosure. Please note; the trash enclosure is required to have a roof over it and it must have a floor drain that tie's into an approved greases trap per Clean Water Services and Building Code requirements. The utility plans do not show this utility connection, please add these lines to the utility plans.***

Response: Details for the proposed trash enclosure are included with this resubmittal as Exhibit E. Details of the required floor drain that tie into an approved grease trap are included as part of Plan Set (Exhibit E, Sheet C5.0).

4. ***Provide documentation from the Oregon Department of Transportation (ODOT) that they acknowledge your proposal. Please note, on the site plan, along Baseline Street, the proposed sidewalk and trees bisect an area of ODOT ROW. This design will need to be noted and approved by ODOT. Please note; within the narrative and plans provided, 'W Baseline Street' is identified and called out. The correct name is 'Baseline Street'.***

Response: Oregon Department of Transportation (ODOT) has acknowledged this proposal and will send a letter to the city of Cornelius addressing the permit requirements and approvals needed for this proposal by October 10th.

The Land Use Narrative and Plan Set have been updated to reflect Baseline Street.

5. Address CMC 18.155, Solar Access for New Development, with a solar shading plan.

Response: The subject site is surrounding by public roadways on three sides. An existing residential structure is located west of the site. The proposed building is situated along the east property line approximately 280 feet from the west property line and thus will not cast a shadow onto the adjacent residential structure.

Landscaping is proposed along the west property and within the parking lot adjacent to the residence as follows:

- A six-foot-high black chain link fence and evergreen hedge comprised of shrubs is proposed along the site boundary to comply with screening standards. The selected vegetation will be maintained to a minimum height of six feet and maximum height of eight feet and therefore will not present a greater shadow than a 25-foot hypothetical wall located at the property line.

- Trees proposed within landscape islands in the parking lots will reach a mature height of 25 feet, however, they are set back approximately 15 feet from the property line and therefore they will not present a greater shadow than a 25-foot hypothetical wall located at the property line.

- A street tree is proposed at the southwest corner of the site. It is within 9.5 feet of the property and will have a mature height of 30 feet. However, the street tree is adjacent to the existing driveway not the residential structure therefore it is not expected to cause shade on the home.

6. Submit a Preliminary Land Partition Checklist (attached). The submitted Lot Line Adjustment Checklist is not applicable.

Response: The Preliminary Land Partition Checklist is included with this resubmittal as Exhibit C

7. Provide a proposed Preliminary Plat. Please note, CMC 17.05.030(F) does require that an 8' PUE be provided along the street frontages (N Adair Street, Baseline Street and N 4th Avenue).

Response: The proposed Preliminary Plat is included with this resubmittal as part of the Plan Set (Exhibit E, Sheet C1.2).

8. Provide interior floorplans of the new building.

Response: The interior floorplans of the proposed building are included with this resubmittal as Exhibit E.

9. The site plan on Page #83 is different than the site plan that is on Page #84, please update.

Response: An updated electrical lighting plan and electrical photometric plan that matches the site plan has been included in the revised Plan Set (Exhibit E).

10. ***Address CMC.45.070 Highway Commercial, C-2 – Signs. Identify if the existing billboard will be removed, as it is considered non-conforming. Please note; Wall and Freestanding signage is approved through a separate sign permit application process. Other on-site signage, such as the menu boards and directional signage are reviewed with the Type III DR application. Directional signage must be small in nature, without corporate logos or advertisement.***

Response: The existing billboard located on tax parcel 1N333CC02400 will be removed as part of the development (Exhibit E, Sheet C1.0).

11. ***The plans show a proposed flagpole. Please provide a detail and description of the flagpole.***

Response: Details of the proposed flagpole are included with this resubmittal as part of the Plan Set (Exhibit E).

12. ***Provide a landscaping plan that adequately addresses the parking lot tree canopy. The total parking lot tree canopy calculation needs to include the combined paved parking lot and drive aisle areas. Any landscaped islands or street frontage is not included in the calculation. The intent behind this legislative requirement is to provide climate relief – not beautification. Please review the Oregon Administrative Rules (OAR 660-012-0405(4)). This includes providing tree canopy for new surface parking areas. "The new surface parking area shall be measured based on the perimeter of all new off-street parking spaces, maneuvering lanes, and maneuvering areas, including driveways and drive aisles." If the size of the area equals or exceeds 0.5 acre (21,780 sf) then the applicant must comply with OAR 660-012-0405(4)(a).***

    (A) installation of solar panels with generation capacity of at least 0.5 KW per new off-street parking space or
    (C) tree canopy covering at least 40 percent of the new parking lot area at maturity but no more than 15 years after planting, or a mixture of the two.

    Regardless of whether your application meets the threshold of 0.5 acre of new parking lot area, all development must comply with OAR 660-012-405(4)(b) by demonstrating 30 percent tree canopy coverage. Additionally, the requirements of OAR 660-012-012-405(c), (d), and (e) must be demonstrated in all applications.

    As noted in the Oregon Administrative Rules, only the tree canopy covering the new surface parking lot counts towards the 40% canopy coverage. As defined, the new surface parking lot is the off-street parking spaces, maneuvering lanes, maneuvering areas, driveways and drive-aisles. Thus, the shading on these surfaces are the only areas of shading at maturity that count toward the 40% coverage.

Response: An updated landscaping plan that addresses the parking lot tree canopy is included with this resubmittal as Sheet L1.0 of the Plan Sheet (Exhibit E).

13. ***The narrative describes that there will be a covered patio area, for seating. The building elevations do not show this structure/patio cover. Please include the patio cover details. If the patio cover is not proposed, then Per CMC 18.45.030(A), a Type II Conditional Use Permit is necessary.***

Response: Details of the proposed covered patio area for outdoor seating are included with this resubmittal. See the Plan Set (Exhibit E).

14. ***Provide details of the covered structures over the drive-thru lanes.***

Response: Details of the proposed covered structures over the drive-thru lanes are included with this resubmittal included in the Plan Set (Exhibit E).

15. ***Pay the following Land Use Application fee;***
    a. ***Type III Site Design Review, $3,918.00***
    b. ***Land Partition Preliminary Plat, $1,566.00***
    c. ***Type II Conditional Use Permit, $1,304.00 (If applied for)***

Response: The listed Land Use Applications will be paid by the applicant at time of resubmittal.

16. ***Provide 2 additional copies of the complete application packet, as amended, per the information above (and below); one full electronic copy of the application packet (CD or thumb-drive with a PDF) and one copy of the application packet that is unbound and 8 ½" x 11" in size.***

Response: Acknowledged. The applicant's representative, 4G Development and Consulting, Inc. has provided two additional copies of the revised application packets.

If you have any questions regarding the revised application materials, please do not hesitate to contact me at (360) 314-2391, or at jpurdom@dowl.com.

Sincerely,



Jaeger Purdom
Planner

c: Mike Towle, DOWL (via email)
Andrew Hunt, 4G (via email)
Nony Rivera, Ware Malcomb (via email)
Steve Schwartz, Chick-fil-A (via email)

Attachment(s):

- Exhibit A – Application Form *(updated)*
- Exhibit B – Type III Design Review Submittal Checklist
- Exhibit C – Land Partition Preliminary Plat Submittal Checklist
- Exhibit D – Pre-Application Conference Summary (PAC-03-24)
- Exhibit E – Plan Set *(updated)*
  - C0.0 Cover Sheet
  - C1.0 Existing Conditions & Demo Plan
  - C1.1 Existing Lot Plan
  - C1.2 Preliminary Plat
  - C2.0 Site Plan
  - C2.1 Public Improvement Plan
  - C3.0 Grading Plan
  - C4.0 Storm Plan
  - C5.0 Utility Plan
  - L1.0 Planting Plan
  - L1.1 Planting Legend & Notes
  - A-302 Exterior Elevations – Color
  - ES1.0 Electrical Site Lighting Plan
  - EP1.0 Electrical Site Photometric Plan
  - EP1.1 Site Lighting Cut Sheet
  - EP1.2 Site Lighting Cut Sheet
  - E5.0 Single Line Diagram
- Exhibit F – Material Palette
- Exhibit G – Truck Turning Diagram
- Exhibit H – Preliminary drainage Report
- Exhibit I – Traffic Impact Analysis
- Exhibit J – Neighborhood Meeting documentation
- Exhibit K – ODOT Permit Documentation
- Exhibit L – Sensitive Area Pre-Screening Site Assessment
- Exhibit M – Flag Pole Details
- Exhibit N – Bike Parking Detail
- Exhibit O – Solar Shading Plan

TYPE III DESIGN REVIEW

Chick-fil-A #05889

2380.16076.01.

September 2024

Prepared for:

4G Development and Consulting Inc.
P.O. Box 270571
San Diego, California 92192

Prepared by:

DOWL

309 SW 6th Ave, Suite 700
Portland, Oregon 97204

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E5.0 Single Line Diagram

F. Material Palette
G. Truck Turning Diagram
H. Preliminary Drainage Report
I. Traffic Impact Analysis
J. Neighborhood Meeting documentation
K. ODOT Permit Documentation
L. Sensitive Area Pre-Screening Assessment
M. Flag Pole Detail
N. Bike Parking Detail
O. Solar Shading Plan

1.0 INTRODUCTION

General Information

Applicant:	**4G Development and Consulting Inc.** San Diego, California P.O. Box 270571 Contact: Austin Cross Phone: 916.817.7587 Email: across@4Gdev.com
Prepared by:	**DOWL** 309 SW 6th Ave, Suite 700 Portland, Oregon 97204 Contact: Matthew Robinson Phone: 971.229.8318 Email: mrobinson@dowl.com
Project Location	25 N 4th Ave; West of 4th Avenue between Baseline and Adair
Parcel ID Numbers:	1N333CC02400, 1N333CC02500, 1N333CC02600, 1N333CC02700, 1N333CC03000
Zoning:	Highway Commercial (C-2)
Overlay(s):	None
Comprehensive Plan:	Commercial
Project Site Area:	Approximately 2.3 acres

2.0 PROJECT SUMMARY

2.1 Project Description

The applicant proposes the construction of a new 4,855 -square-foot restaurant with dual 12-foot-wide drive-through lanes and associated improvements throughout the project site. Site improvements include a covered outdoor dining area, paving and striping the parking lot, new curbing and traffic marking, new perimeter landscaping and screening, and interior parking lot landscape planters. A total of 74 parking spaces will be provided for restaurant customers (of which 70 will be standard stalls, two will be van accessible stalls, and three will be standard ADA-accessible parking spaces). A Preliminary Land Partition has also been requested to consolidate existing legal lots into a single lot for purposes of development.

Traffic will enter the project site via N Adair St (west bound Tualatin Valley Highway/Highway 8) and Baseline St (east bound Tualatin Valley Highway/Highway 8) from two driveways, with one-way traffic entering from both N Adair St () and Baseline St. The two driveways will be limited to left-in/left-out movements offering customers and commercial vehicles convenient access to the restaurant. Vehicular access is not provided from N 4th Avenue. The southwest drive aisle will serve as the entry point to the dual drive-through lane, which wraps around the building and terminates at the Northeast corner of the project site. Drive aisles of varying widths will provide access for internal traffic circulation to the restaurant building. Additional access and utility information are provided later in this narrative.

Existing city utilities (water, sewer, and stormwater) are available from N 4th Avenue and Baseline St. Therefore, the applicant requests approval to extend water service from the existing main in N 4th Avenue and extend a new sanitary sewer lateral from the existing mainline in Baseline Street to support the proposed restaurant.

Consistent with feedback from city staff, the applicant is requesting approval through the Type III Design Review procedure along with a Preliminary Land Partition to consolidate five existing parcels into a single lot for purposes of site development. The Land Use Application Form is included with this submittal as **Exhibit A**. Submittal checklists have also been completed for each land use action and are included as **Exhibits B** and **C**.

The project site is zoned as Highway Commercial (C2) with no natural resource features. Surrounding lots to the north, south, and east, are zoned as Highway Commercial. About 425 feet to the west of the site lots are zoned Corridor Commercial (CC).

A pre-application conference (PAC 03-24) was held on March 12, 2024, to discuss the proposal for a new restaurant with dual drive-through lanes. Staff confirmed that a Type III Design Review subject to approval by the Planning Commission is required. A copy of the consolidated pre-application conference notes are included as **Exhibit D.**

2.2 Existing Conditions

The project site is approximately 2.28 acres and is comprised of five (5) tax lots further identified as 1N333CC02400, 1N333CC02500, 1N333CC02600, 1N333CC02700, 1N333CC03000, herein referred to as the "Project Site". The site is situated between the east bound and west bound segments of Tualatin Valley Highway at the intersection of Fourth Avenue as reflected in Figure 1: Vicinity Map. Within the project site, parcels 1N333CC03000 and 1N333CC02500 are currently

vacant with no existing structures. Parcel 1N333CC02700, 1N333CC02600, and 1N333CC02400 currently have existing single-family homes on them. The existing billboard located on tax parcel 1N333CC02400 will be removed as part of the development. The applicant intends to consolidate the five parcels into a single lot of record and has submitted a preliminary land partition request concurrent with this Type III Design Review consistent with staff direction.

Adjacent uses are identified in Table 1 below. A zoning map is provided as Figure 2.

Table 1: Adjacent Uses

	Zoning	Use
North	C2	Highway Commercial
South	C2	Highway Commercial
East	C2	Highway Commercial
West	C2	Highway Commercial

Figure 1: Vicinity Map



Figure 2: Zoning Map



3.0 CORNELIUS MUNICIPAL CODE (CMC)

The applicable development code provisions are set forth below with responses demonstrating the project's consistency with these provisions.

Title 13 Public Utilities

13.25 Sewer Connections

13.25.010 Connection required

Every residence, building or place where human beings reside, assemble or are employed, within the city, shall be required to connect to the city sanitary sewer system where such connection is available within 200 feet. In areas where city sanitary sewers are not available for connection, every residence, building or place where human beings reside, assemble or are employed shall be required to have a sanitary method for disposal of sewage.

Response: Public sanitary sewers exist along the Baseline Street frontage and on the east side of 4th. Both sewers have capacity for the project. A private sanitary lateral extension is proposed from Baseline Street to serve the new building as reflected in the Utility Plan included as **Exhibit E.** No public sanitary sewer improvements are required.

13.25.040 Permit and connection requirements.

No connection shall be made with any sewers or drains except by persons authorized to perform the work by a permit issued after application to the city manager. All work related to a sewer connection must meet the standards fixed by the city and shall not be undertaken until the permit has been issued and the connection shall not be covered or back-filled until it has been inspected and approved by an authorized representative of the city.

Response: Acknowledged. The applicant will not create connections from existing public sewer and water infrastructure until the required permits are obtained.

13.25.070 Grades and changes

All drains and private sewers laid in any street, alley or public place shall conform to such grades and lines as may be approved by the city, and as little as possible of the trench shall be dug until the branch pipe is found in the public sewer. All drains shall be laid as nearly as possible in straight lines and uniform grades, and any change in direction or grades shall be made with fittings or curves as may be approved by the authorized agent of the city.

Response: Acknowledged. If the applicant must lay new drains or sewer lines in any street, alley, or public place, they will do so using minimal digging and uniform grades. If changes in direction occurs when laying these pipes, fittings or curves that are approved by authorized city agents will be used.

13.25.120 Permit application and inspection fees

A. No connection shall be made to the city sewerage collection system without first obtaining a permit as required under the terms and provisions of this chapter, in addition to the payment of a sum established by resolution of the city council as and for a connection charge which connection charge shall be payable at the time of issuance of the building permit. In addition to the connection charge, plan check fees to cover the cost of review and approval of subdivision maps of street names and other elements of the local sewage collection system, not including house connections, and inspection of sewer construction, except house connections, shall be established by resolution of the council.

Response: Acknowledged. The applicant will first obtain a permit before a connection to the City's sewage collection system is established.

B. Permit Fees.

1. In addition to all other charges, the applicant for connection shall pay permit fees to cover the cost of processing the permit application and performing the inspection of property connections to the sewer system as follows: Commercial = $35.00

Response: Acknowledged. The applicant will pay applicable permit fees to cover costs associated with the inspection and processing of said permit.

2. If anyone making a connection applies for an inspection on a day other than a regular working date for the inspectors, the applicant shall be charged with and pay an additional inspection fee of $5.00 for each inspection. If additional inspections are required due to failure of the building sewer to pass the requirements for the installation of the sewer, the applicant shall be charged with and pay an additional inspection fee of $5.00 for each inspection. The additional inspection fee shall be paid prior to final approval of the connection being inspected.

Response: The applicant acknowledges this provision.

Title 15 Building and Construction

15.05 Building Code

15.05.050 Permit requirements

A. In addition to the requirements found elsewhere in this code and imposed in the Oregon Building Code for the issuance of a building permit, no such permit shall be valid unless:

(1) Domesticwater supply, sanitary sewer and storm water facilities are installed and approved of by the city engineer or public works director for service to the premises for which the permit is sought; and

Response: Water: An 8-inch ductile iron water main exists on 4th Avenue adjacent to the site. The existing water main meets current standards. A 12" ductile iron water main exists on N Adair Street which meets current standards. A four-inch unlined cast iron water main exists along the Baseline Street frontage that does not meet standards. The applicant will need to replace the substandard pipe with an eight-inch C900 pipe.

Sanitary Sewer: Public sanitary sewers exist along the Baseline Street frontage and on the east side of 4th Avenue. Both these sewers have capacity for the project. No public sanitary sewer improvements are required.

Stormwater: A public storm sewer exists on the east side of 4th Avenue. As part of the frontage improvement on N Adair Street and Baseline Street, catch basins and new storm sewers need to be installed along the frontage.

(2) Street improvements, street lighting, required sidewalks, if any, have been installed and approved by the city engineer and according to the city's standards and specifications; or, in the alternative, the applicant has agreed in writing to provide the city with an improvements guarantee along with sufficient monetary assurances (in form, manner and amount approved of by the city attorney, city manager and city engineer) sufficient to cover the costs associated with the design, construction and maintenance of those improvements.

Response: Frontage improvements will be made to Baseline Street, South 4th Avenue, and North Adair Street. The improvements are further explained in this narrative under Title 18 and reflected on Sheet C2.1 of the Plan Set, (**Exhibit E**).

B. In addition to the conditions noted in subsection (A) of this section, the city's building official, community development director and/or the city manager have the authority to condition issuance of (or revoke or stop work under) any building permit required by any of the specialty codes comprising the State Building Code upon proof of payment of all appropriate building permit fees as well as proof of payment of any or all of the following fees, liens and taxes:

1. **Payment of business license taxes imposed under the terms of CMC Title 5 on any contractor or subcontractor working on a structure in the city; director for service to the premises for which the permit is sought; and Response:**

2. **Payment of all system development charges that may be due as a result of the building activity required by the permit**

3. **Payment of any outstanding nuisance or other liens levied on the property for which the building permit is issued; and**

4. **Payment of the construction excise tax imposed by the Forest Grove School District and/or Hillsboro School District and the Metro Council. [Ord. 801 § 1, 1999; Code 2000 § 10.025; amended during 2007 recodification.**

Response: The applicant will pay for required fees and if needed, will provide proof of payment for said fees.

Title 17 Subdivisions

17.05 Land Divisions

17.05.030 Land partitioning

A. Requirements for Land Partitioning Actions.

1. **No person shall partition an area, parcel or tract of land without the approval of the planning commission or the community development director in accordance with the standards and regulations contained in this section.**

Response: Acknowledged. The applicant has submitted for preliminary plat approval to consolidate the subject site into a single lot of record consistent with staff direction at the pre-application conference. The consolidation plan is included in the Plan Set (Sheet C1.2 of **Exhibit E**).

2. **The standards and regulations of this section shall apply to partitions of land as defined in ORS 92.010(9).**

Response: The Applicant acknowledges this provision. The land partition action in this proposal is to consolidate five separate lots into one single lot. The consolidation plan is included in the Plan Set (Sheet C1.2 of **Exhibit E**).

3. **The community development director shall coordinate and assemble through the facilities and design review process the reports and data submitted by the applicant, affected city departments and any governmental agencies having an interest in partitions. The community development director shall determine whether the partition meets the criteria in subsection (C) of this section.**

Response: The applicant acknowledges this provision.

4. **The community development director shall approve, approve with conditions or deny the proposed partition in writing based on the criteria of subsection (C) of this section, within 45 days of submittal of a complete application.**

Response: The applicant acknowledges this provision.

5. **Notice and review of the community development director's decision shall be pursuant to CMC 18.15.030.**

Response: The applicant acknowledges this provision.

6. **If the area or tract of land to be partitioned exceeds two acres, and within one calendar year is being partitioned into more than two parcels, any one of which is less than one acre, full compliance with all requirements for subdivision may be required if the community development director or planning commission determines that the entire parcel being partitioned is in the process of being divided into lots or tracts which would otherwise be subject to subdivision regulations if the partitioning did not occur within one calendar year.**

Response: The project site is 2.28 acres and is made up of five lots, each not exceeding two acres. An existing lot plan is included as Sheet C1.1 of the Plan Set (**Exhibit E**). As previously discussed, the land partition request is to consolidate the five lots into one lot, as such the requested action is not subject to subdivision regulations. The consolidation plan is included in the Plan Set (Sheet C1.2 of **Exhibit E**).

B. Application Requirements. The community development director shall provide forms that specify the information required for submission of land partitions. The applicant shall prepare a map together with other supplementary material as may be required and shall submit the necessary number of copies to the community development director.

Response: An existing lot plan and proposed lot consolidation plan have been included in the development Plan Set (**Exhibit E**) showing current and future conditions.

C. Approval Criteria. A request to partition land must meet all of the following criteria:

1. **The proposal conforms with the city's comprehensive plan; and**

Response: The proposed lot consolidation will support development of the site as a cohesive commercial development consistent with the underlying zoning and the City's comprehensive plan. The development will complete necessary improvements to support commercial development as discussed throughout this narrative.

2. **The proposal complies with all applicable statutory and ordinance requirements and regulations; and**

Response: The development proposal complies with the applicable statutory and ordinance requirements put forth by the city of Cornelius as discussed within this narrative and further reflected in associated submittal documents.

3. **Adequate public facilities are available to serve the proposal; and**

Response: Adequate public facilities are available or will be constructed as part of this development consistent with this provision.

4. **All proposed lots conform to the size and dimensional requirements of this chapter; and**

Response: The five proposed lots conform to the size and dimensional requirements of this chapter.

5. **All proposed improvements meet city standards.**

Response: All improvements proposed as part of the development meet city standards.

D. Required Improvements. For any partitioning of land, where applicable, the following design and development standards and requirements may apply to partitions. These standards shall apply at the point of construction of improvements and/or land developments. The community development director shall have the authority to impose any such standards or requirements as conditions of approval.

Response: The applicant will construct frontage improvements to existing public roads along the site boundary as reflected in the Public Improvement Plan (Sheet C2.1 of **Exhibit E**). Frontage improvements will be consistent with city standards.

E. Streets. The location, width and grade of streets shall be considered in relation to existing and planned streets, to topographical conditions, to public convenience and safety, and to the proposed use of the land to be served by such streets. Where location is not shown in the comprehensive plan, the arrangement of the streets in a land division shall either:

1. **Provide for the continuation or appropriate projection of existing principal streets in surrounding areas; or**

2. **Conform to standards adopted by the city. All streets shall be designed in accordance with standards set forth in the adopted Cornelius public works standards.**

Response: No new roads will be constructed as part of this partition request. The applicant will construct frontage improvements to existing public roads along the site boundary as reflected in the Public Improvement Plan (Sheet C2.1 of **Exhibit E**). Frontage improvements will be consistent with city standards.

3. **All streets and alleys within the development and those adjacent streets which directly serve the development shall be fully improved, including grading, base grade, paving, and installation of curbs, all constructed to design specifications as approved by the city engineer. All streets to be constructed and/or improved shall comply with the minimum street improvement standards contained in this title. In cases where physical conditions warrant it, special soils analysis or engineering designs may be required by the city engineer. In addition, where a proposed partition abuts a substandard arterial or collector street, the developer shall provide to the community development director, prior to final plat**

approval, adequate guarantees that, within one year from the issuance of a building permit for construction within the development, such abutting arterial or collector street or streets shall be improved in a manner which is compatible with the standards for streets contained in this title. Adequate guarantee shall consist of formation of a local improvement district or provision of a security in an amount sufficient to cover the estimated actual improvement cost, plus 15 percent.

Response: Part of the proposed development includes frontage improvements on North Adair Street, Fourth Avenue, and Baseline Street. All frontage improvements will be made in accordance with the standards and requirements within this code. Proposed improvements are reflected on the Public Improvement Plan (Sheet C2.1 of **Exhibit E**).

F. Easement.

1. **Utility Lines. Easements for sewers, drainage, water mains, electric lines, or other utilities shall be dedicated. Easements for water, sewer, or drainage on interior lot lines shall be 20 feet in width, the center line of which shall be the lot lines. Easements for water, sewer, or drainage along exterior lot lines shall be 20 feet in width, except no easement will be required for those lot lines paralleling a street or other public way. Tie-back easements shall be six feet wide and 20 feet long along lot side lines at change of direction points of the lot lines. Easements for utilities such as electrical, gas, cable, and fiber optics (public utility easement, or PUE) shall be dedicated along all right-of-way frontages, including woonerfs, and shall be eight feet in width. A PUE is not required along the right-of-way of an alley, unless a parcel on an alley does not also front on a street or woonerf directly.**

Response: There are no proposed easements within the project site. Therefore, this provision does not apply.

2. **Watercourses. Where a land division is traversed by a watercourse, drainage way, channel, or stream, a storm water easement or drainage right-of-way conforming substantially to the lines of such watercourse, and such further width as will be adequate for the purpose, may be required. Streets or parking ways parallel to watercourses may be required. Watercourse easements and drainage rights-of-way shall be consistent with Clean Water Services (CWS) standards.**

Response: There are no existing watercourses that travel over or into the development area. Therefore, this provision does not apply.

G. Lot Size and Shape. Lot size, width, shape and orientation shall conform to the requirements of this title for the applicable zoning district.

Response: Pursuant to CMC 18.45.040, there is no minimum lot size, width or shape. The only requirement is that the lot must be large enough to accommodate the proposed use. As demonstrated on the Site Plan, Sheet C2.0 of **Exhibit E**, the site is adequate to accommodate the proposed restaurant and associate site improvements.

H. Access. Each lot shall abut upon a public street, for a distance of at least 20 feet, and comply with CMC 18.143.050, Access standards.

Response: The resulting consolidated lot has adequate frontage along three public streets. The project will take access from N Adair Street and Baseline Street. No vehicular access is proposed from 4th Avenue.

I. Dedications. Public streets, sidewalks, pedestrian ways, bike paths, parks, open space, and other public rights-of-way required by or reasonably related to the development shall be dedicated or otherwise conveyed to the city or the appropriate jurisdiction for maintenance. Further, any park or open space proposed may be required to be dedicated to the public if it is designated in the city's comprehensive plan. An appropriate instrument granting or conveying the park or open space must be approved by the jurisdiction to whom the park or open space is being dedicated prior to final plat approval.

Response: As part of the development, frontage improvements will be made on North Adair Street, North 4th Avenue, and Baseline Street. These public right of way improvements will be dedicated to the city as required.

J. Utilities. All utilities shall be placed underground per standards identified by the city engineer.

Response: All new utilities will be placed underground in accordance with this provision and requirements put forth by the city engineer. Existing overhead powerlines located on Baseline Street will be buried.

K. Street Trees. Trees shall be installed along street frontages in accordance with the adopted Cornelius public works standards. Actual location and spacing of trees shall be at the discretion of the city engineer.

Response: The applicant has planned for the addition of 36 Street trees to meet the standards of this subsection and chapter 5 of the adopted public works standards. 19 street trees will be located evenly spaced along the south frontage of North Adair Street. 13 trees will be located evenly spaced along the north frontage of Baseline Street. 8 trees will be located evenly spaced along the west frontage of N 4th Avenue. Street trees along 4th Avenue and Baseline Street will be located within a proposed easement area. See Sheet L1.0 of the Plan Set (**Exhibit E**).

L. Compliance with Approvals.

1. Requirements Prior to Commencement of Work. Prior to any construction, improvements or land development, the developer shall perform the following:

a. The developer shall file detailed plans and specifications for all public improvements or land development together with a detailed cost estimate and an estimate of time reasonably necessary to complete such improvements for approval by the city engineer or designee.

Response: The developer will provide the required plans and cost estimates to the city engineer for approval before commencement of work.

b. The developer shall enter into a contract with the city of Cornelius to make, install and complete within the time fixed, but in no case more than two years from the date of execution of said contract without written approval by the city engineer and community development director, all improvements in accordance with the approved plans prior to acceptance of the improvements by the city and/or plat recordation. If the developer chooses to bond for said improvements prior to acceptance of the improvements (to allow plat recordation to occur prior to completion of the public improvements), the developer shall cause to be filed with the city recorder a security acceptable to the community development director payable to the city of Cornelius in a principal sum determined from the approved estimate of the costs of said improvements of this section. The security shall assure the performance of the said contract and the completion of the said improvements, free of liens. Notwithstanding any of the above, a security shall be provided for any improvements to be performed within public rights-of-way and/or public easements, and all erosion control measures.

Response: The applicant acknowledges the requirement to complete the required improvements consistent with the approved plans.

c. The amount of the security shall be based on an estimate of the cost of the work approved by the city engineer in accordance with the following schedule:

i. Public and private improvements within public rights-of-way and/or public easements, and all erosion control measures, in conformance with city and Clean Water Services standards, equals 150 percent of cost estimate.

Response: Acknowledged.

2. **Improvement Procedures. All improvements shall conform to the requirements of this chapter and any other improvements standards or specifications adopted by resolution of the city council and shall be installed in accordance with the following procedures:**

    a. **Improvement work shall not be commenced until plans have been checked for adequacy and approved by the city. To the extent necessary for evaluation of the land division proposal, such plans may be required before approval of the final plat.**

Response: The applicant acknowledges this provision. Improvement work will not start until the required preliminary plans have been checked and approved by the city.

    b. **Improvement work shall not be commenced until the developer has secured the appropriate development permit. If work has been discontinued for any reason, it shall not be resumed until the city has been notified and consented in writing.**

Response: The applicant acknowledges this provision. Improvement work will not start until the developer has secured the appropriate permits.

    c. **All required improvements shall be constructed under the inspection and to the specifics of the city engineer, adopted Cornelius public works standards, and Cornelius Municipal Code. The city may require changes in typical sections and details if unusual conditions arise during construction to warrant such change in the interests of the city or the developer. Upon acceptance of the required improvements, the city engineer shall notify the developer that the improvements are acceptable as per Cornelius Municipal Code. Acceptance shall be in writing.**

Response: The applicant acknowledges this provision.

    d. **All underground utilities, sanitary sewers, storm drains, and cable communication system facilities installed in streets shall be constructed prior to the surfacing of such streets. Stubs for service connections for all underground utilities, sanitary sewers and cable communication system facilities shall be placed to such length as will obviate the necessity for disturbing the street improvements when service connections are made.**

Response: The necessary utilities that will serve the development will be installed prior to the surfacing of abutting streets and sidewalks. Stubs for service connections will be placed at an appropriate length above the ground so that newly completed frontage improvements will not be disturbed.

e. **A map showing all public improvements as built shall be filed with the city engineer upon completion of said improvements.**

Response: The applicant acknowledges this provision. A map of the completed public improvements will be filed with the city engineer after completion of said improvements.

3. **Improvement Requirements. Improvements to be installed at the expense of the developer are as follows:**

a. **Streets.**

i. **All streets, including alleys.**

ii. **Streets adjacent but only partially within the partition or subdivision.**

iii. **The extension of the land division streets to the intercepting paving line of existing streets with which the land division streets intersect.**

iv. **Arterial or collector streets which intersect with streets within the development that provide ingress or egress to the development or on which there are traffic impacts reasonably related to the development.**

v. **All streets shall be built in accordance with adopted Cornelius public works standards and the adopted Cornelius transportation system plan.**

Response: Street improvements will be made to the abutting frontages of North Adair Street, North 4th Avenue, and Baseline Street as reflected in the Public Improvement Plan (Sheet C2.1 of **Exhibit E**).

b. **Surface Drainage and Storm Sewer System. Drainage facilities shall be provided within the land division to connect the land division drainage to drainage ways or storm sewers outside the land division. Design of drainage shall be in accordance with adopted Cornelius public works standards and shall allow for the extension of the system to serve other areas.**

Response: Two new stormwater facilities will be constructed along the southern perimeter of the development. The proposed stormwater facilities will be built in accordance with the cities site development code. The proposed stormwater facilities will mitigate water drainage from the sites surface so there will be no adverse effect on neighboring properties.

c. **Sanitary Sewers. Sanitary sewers shall be designed in accordance with adopted Cornelius public works standards**

and installed to serve the land division and to connect the land division to existing mains.

Response: Public sanitary sewers are located within Baseline Street and 4th Avenue. Both sewer lines have capacity to serve the project. A new sanitary sewer lateral will be extended from the sewer line in Baseline Street to serve the project. No public sanitary sewer improvements are proposed or required.

d. Water System. Water lines with valves and fire hydrants serving the land division, connecting the land division to city mains, shall be installed in conformance with the adopted Cornelius public works standards. The design and construction by the developer shall take into account provisions for extension beyond the land division and to adequately grid the city system.

Response: Public water lines are located within Baseline Street, 4th Avenue, and North Adair Street. The applicant will replace a substandard four-inch unlined cast iron water main along the Baseline Frontage with an eight-inch C900 pipe. Connections will need to be made from these abutting water lines to serve the proposed fast-food restaurant.

e. Street Trees. Street trees shall be planted along street frontages in accordance with the following:

i. For all land divisions, the developer shall pay a per tree security to the city. The surety bond shall be based upon the number of trees included in an approved street tree plan.

ii. Trees shall be planted in accordance with the adopted Cornelius public works standards.

Response: The applicant has planned for the addition of 36 street trees to meet the standards of this subsection and chapter 5 of the adopted public works standards. 19 street trees will be located evenly spaced along the south frontage of North Adair Street. 13 trees will be located evenly spaced along the north frontage of Baseline Street. 8 trees will be located evenly spaced along the west frontage of Baseline Street. 11 trees will be located evenly spaced along the North frontage of Baseline Street. See Sheet L1.0 of the Development Plans (**Exhibit E**) for further details on the proposed street trees.

f. Bike and Pedestrian Ways. Bike and pedestrian ways shall be constructed according to adopted Cornelius public works standards.

Response: New sidewalks will be constructed along Baseline Street and N Adair Street adjacent to the site. Portions of the existing sidewalk along 4th Avenue will b replaced as part of this project. Sidewalks will be designed and constructed according to the city's public works standards. See Sheet C2.1 of the Development Plans (**Exhibit E**) for further details.

g. Street Lights. Street lights shall be installed in accordance with adopted Cornelius public works standards.

Response: Three streetlights will be installed along Baseline Street adjacent to the site in accordance with public works standards.

h. Curb cuts and driveway installations are not required of the developer but, if installed, shall be according to adopted Cornelius public works standards.

Response: The development will include two standard concrete driveways are proposed on both North Adair Street and Baseline Street leading into the development. Both driveways will be installed in accordance with the city's public works standards.

i. Internal sidewalks or pathways shall be provided to ensure safe and convenient pedestrian circulation throughout the development.

Response: The development will include internal sidewalks to facilitate safe pedestrian circulation throughout the development. North Adair Street and Baseline Street will incorporate pedestrian walkways that lead into the development from the abutting pedestrian sidewalks.

4. Final Plat Approval. The community development director shall review the final plat for compliance with the approved preliminary plat. If the community development director determines that the final plat conforms to the approved preliminary plat, the community development director shall so certify and sign the final plat. If the final plat does not conform, it shall be returned to the developer to correct the deficiencies and must be resubmitted for approval within the time established by the community development director.

Response: The applicant acknowledges this provision.

5. Filing of Final Plat. Approval of the final plat by the city as provided by this regulation shall be conditioned on its prompt recording. The developer shall, without delay, submit the final plat for signatures of other public officials required by law. Approval of the final plat shall be null and void if the plat is not recorded within 30 days after the date the last required approving signature has been obtained. Prior to issuance of any development permits the applicant shall provide to the planning department one copy of the recorded final plat signed by all public officials.

Response: The applicant acknowledges this provision.

Title 18 Zoning

18.45 Highway Commercial Zones

18.45.020 Uses permitted outright.

E. Indoor amusement or entertainment and restaurants, including fast food with drive up window.

Response: The applicant proposes a 4,855 square-foot drive-through restaurant, which is considered an "Indoor amusement or entertainment and restaurants" use. Per CMC 18.45.020, Indoor restaurants, including fast food with drive-up window uses are considered a use permitted outright, provided, that all operations are conducted within an enclosed structure.

18.45.040 Development requirements.

A. Lot Size. In a C-2 zone there is no minimum lot size, save and except that the lot must be large enough to accommodate the proposed use, including all design standards and functional requirements related to the use.

Response: The project site is approximately 2.28 acres in size and is comprised of five separate lots which will be consolidated as part of this application. As reflected in the site plan, the size of the project area is large enough to accommodate the proposed use including all design standards and functional requirements related to the use.

B. Setback Requirements. In a C-2 zone the following setbacks shall meet the base standard; however, the review body may require a greater or lesser setback based on the design review criteria set forth in this chapter:

1. The front yard shall be 10 feet, except that:

a. Parking shall be within five feet of the front property line.

b. For all properties abutting the south side of Baseline Road, there shall be a front yard setback equal to five percent of the average lot depth, but not less than four feet.

Response: The subject site has public roads along three sides. For the purpose of establishing and meeting yard requirements, the applicant assumes Fourth Avenue is the front lot line. As reflected in the Site Plan, Sheet C2.0 of **Exhibit E**, there is no parking proposed along that site boundary and an approximately 14-foot-wide front yard is proposed consistent with this provision. The project site is located along the north side of Baseline Road therefore provision b of this subsection does not apply.

2. No side yard shall be required, except five feet when abutting a residential use or zone, and when a side yard abuts a public street the setback shall be the same as the front yard.

Response: The subject site has public roads along three sides. Given that Fourth Avenue was determined to be the front lot line, side yards for this development are assumed to be along Baseline Street and N Adair Street. A minimum five-foot-wide yard is proposed between parking areas and the north property line abutting N Adair Street. Site improvements along Baseline Street include a driveway, landscaping and stormwater facilities. The stormwater facilities are setback at least 10 feet from the property line consistent with the required side yard setbacks for this zone. The project meets minimum side yard requirements.

3. **No rear yard is required, except five feet when abutting a residential use or zone, and when a side yard abuts a public street the setback shall be the same as the front yard.**

Response: A minimum five foot wide yard is proposed between the rear property line, along the west, and the parking consistent with this standard.

C. Height of Building. No building shall exceed a height of 35 feet, unless approved by the planning commission.

Response: The proposed restaurant will be a single story building 20 feet 10 inches in height, consistent with this standard. Architectural elevations have been included in the submittal as Sheet A-302 of **Exhibit E**.

18.45.050 Performance standards.

In a C-2 zone no land or structure shall be used or occupied unless there is continuing compliance with the following standards:

A. Design Review Approval. All design review requirements and conditions of approval, including all prior attached conditions shall be satisfied.

Response: The applicant acknowledges that the proposed restaurant will need to meet all design review requirements and conditions of approval.

B. Environmental Standards. All uses shall comply with required air, land, and water quality standards set forth by all state, federal and local jurisdictions (i.e., Department of Environmental Quality, Clean Water Services, and Metro).

Response: The applicant acknowledges that the proposed restaurant will need to comply with required air, land, and water quality standards set forth by all state, federal and local jurisdictions.

C. Heat and Glare.

1. **Except for exterior lighting, operations producing heat or glare shall be conducted entirely within an enclosed structure, such that glare is not visible from a public street or adjacent property.**

2. **Exterior lighting shall be designed such that glare is directed away from public streets or adjacent properties.**

Response: Within the proposed restaurant, heat or glare producing operations will be enclosed within the restaurant structure. Exterior lighting on the development will be directed away from public streets.

D. Insects and Rodents. Materials including wastes shall be managed and stored, and grounds shall be maintained in a manner that will not attract or aid the propagation of insects or rodents or create a health hazard.

Response: A screened trash enclosure is proposed near the middle of the site near the entrance of the drive through lanes. The trash enclosure will accommodate recycling, food waste and garbage bins in a manner that will not attract insects or rodents.

18.45.060 Development standards.

In a C-2 zone no new use or occupation of land or a structure or a new structure and no change of use of land or a structure shall be permitted unless there is continuing compliance with the following standards:

A. Landscape Plan.

1. For all uses in a C-2 zone, the first five feet of lineal street frontage on the subject site shall be landscaped (exclusive of frontage trees) prior to occupancy, in accordance with the approved site plan and the standards set forth herein.

Response: The applicant has planned for the first five feet of lineal street frontage on the project site to be landscaped to meet the requirements of CMC 18.45.060.A. Street trees proposed along Baseline Street and N 4th Street are proposed within an easement. See Sheet L1.0 **Exhibit E** for street tree locations and proposed easements along all frontages.

2. When at maturity, at least 80 percent of the proposed landscape area shall be covered by plant material, lawn, and trees. The remaining area may be covered in nonvegetative ground cover.

Response: The applicant has planned for 80% of the landscaped areas to be covered by plant material, lawn or trees while the other remaining landscaped area is to be cover with non-vegetative ground cover. See Sheet L1.0 of the Development Plans (**Exhibit E**) for further details regarding proposed site landscaping.

3. Street Trees. Street trees shall be required and shall be selected from the approved public works street tree list. The total number of trees shall be determined by dividing the total linear footage of the site, which abuts a public street, by 30 feet. The location of the trees shall be determined through design review, and the trees shall be installed in accordance with Chapter 5 of the adopted public works standards.

Response: The applicant has planned for the addition of 36 street trees to meet the standards of this subsection and chapter 5 of the adopted public works standards. 19 street trees will be located evenly spaced along the south side of North Adair Street. 13

trees will be located evenly spaced along the north side of Baseline Street. 8 trees will be located evenly spaced along the west side of N 4th Avenue. See Sheet L1.0 and L1.1 of the Development Plans (**Exhibit E**) for further details regarding proposed street tree locations and species information.

4. **Installation of required landscaping may be deferred for up to six months; provided, that the owner posts with the city a cash deposit or irrevocable letter of credit assigned to the city for an amount equal to 150 percent of the estimated cost of the landscaping materials and installation by a qualified contractor.**

Response: The applicant acknowledges the fees required if they elect to postpone the installation of required landscaping.

B. Vehicular Access, Internal Circulation and Clear Vision Areas

1. **Where possible, vehicular access to commercial developments shall be from abutting arterial or collector streets, and shall be shared with adjacent properties to minimize multiple curb cuts. Access to individual lots from T.V. Highway shall be approved by ODOT with secondary access from adjacent collectors or minor local streets where possible. Except in the case of a multi-building complex, direct lot access to an arterial shall not be permitted, unless there is no viable alternative, and direct access to collector and local streets shall only be allowed as permitted by the review body.**

Response: The restaurant will have two vehicular access points, one located in the northwest corner of the site along North Adair Street (downtown arterial) and one in the southwest corner of the site along Baseline Street (downtown arterial).

2. **The minimum public street width for commercial development shall comply with Chapter 5 of the adopted public works standards.**

Response: After the required frontage improvements are complete, the width of the adjacent public streets will exceed the minimum requirement of 50 ft stated in Chapter 5 of the adopted public works standards.

3. **Internal Access. All internal roadways and drives shall be paved and maintained by the owner in accordance with city standards. No entrance or exit shall be located closer than 100 feet to any intersection of a public street, unless there is no reasonable alternative. They shall have the following minimum unobstructed pavement width:**

   a. Two-way traffic: 24 feet;

   b. One-way traffic: 15 feet.

Response: The internal drive aisles within the development will be paved and maintained by the owner. Both access points to the site are located more than 100 feet away from

any intersection of a public street. The internal drive aisles are intended for two-way traffic and meet the minimum unobstructed pavement width standards (24 feet) within this subsection.

4. **Internal sidewalks or pathways shall be provided to ensure safe and convenient pedestrian circulation throughout the development.**

Response: Internal sidewalks are provided within the development and are comprised of concrete material or asphalt where pedestrian circulation routes cross vehicular aisles. Internal crosswalks will be delineated with yellow striping. These designated pathways are intended to facilitate safe and convenient pedestrian circulation throughout the development.

5. **Clear vision areas shall be provided at all roadway and driveway intersections in accordance with the vision clearance standards set forth in CMC 18.150.070.**

Response: In accordance with the vision clearance standards, the clear vision zones established on the development access points have no structures that impede visibility.

C. Access Streets – Sidewalks – Drainage.

1. **All streets shall be designed in accordance with Chapter 5 of the adopted public works standards.**

Response: Frontage improvements proposed along N Adair Street, Baseline Street and Fourth Avenue meet applicable provisions of Chapter 5 of the adopted public works standards.

2. **All driveways for new construction shall have minimum pavement width of 12 feet and shall not be more than 35 feet in width at the curb, unless specifically approved by the review body to meet unusual requirements of a particular use. Each driveway shall have a concrete curb apron designed to comply with public works standards.**

Response: Access driveways for the development are designed with a pavement width of 28 feet. A concrete curb apron will be incorporated into both driveways in accordance with public work standards.

3. **Cul-de-sacs shall serve no more than four separate uses and shall have a minimum turning radius of 50 feet measured to the front edge of the curb.**

Response: There are no cul-de-sacs proposed as part of the development. This provision does not apply.

4. **Sidewalks and Improvements.**

a. For all new construction, curbs, gutters, and a minimum six-foot-wide sidewalk, with eight feet at a bus stop, shall be provided along the entire lot frontage, and shall meet ADA accessibility standards.

Response: As part of the development, curbs, gutters, and six-foot-wide sidewalks will be provided along the north and south lot frontage and shall meet ADA accessibility standards. Improvements of the east frontage abutting 4th Avenue include raising the existing driveway portion of the sidewalk and curb.

5. Storm drainage shall be managed through a system of underground drainage lines and catch basins, which convey storm water off the site to a public storm system, and shall comply with Clean Water Services (CWS) standards for water quality and quantity.

Response: As part of the development, storm water drainage will be connected to the preexisting system of underground drainage lines located on the east side of 4th Avenue and will comply with Clean Water Services standards. On the south perimeter of the site there will be two separate stormwater facilities. A preliminary drainage report has been prepared for the project and describes the proposed stormwater design and approach. The report is included as **Exhibit H**.

D. Lighting Streets. Streets and walkways shall be lighted during the hours of darkness in accordance with public works standards.

Response: Three streetlights will be added to the frontage abutting Baseline Street in accordance with public works standards.

E. Mailboxes. Except for in-fill partitioning, clustered mailboxes shall be provided, consistent with the locational criteria set by the Post Master. They shall be of uniform style.

Response: The proposed development does not require clustered mailboxes. Therefore, this provision does not apply.

F. Screening

1. Sight-obscuring screening shall be provided for all garbage and trash collection areas, and for any approved outdoor storage, or parking lots abutting a residential development. Such screening shall be six feet in height, and shall consist of a wall of brick, stone, or other substantial material, or a densely planted evergreen hedge and a decorative fence, such as wrought iron, or PVC or polymer covered chain link fencing. Galvanized chain link fencing shall not be permitted on new construction.

Response: As part of the development, screening will be provided for the garbage storage and collection area located at the south end of the middle off-street parking landscaped island. An existing residence is located west of the subject site therefore screening of the parking lot between the rear property line and the off-street parking area has

been proposed. The screening will consist of a combination of shrubs and trees as reflected in Sheet L1.0 of the Development Plans (**Exhibit E**).

2. **The reviewing body may require nonsight-obscuring screening and/or fencing of parking lots abutting property lines, front yards abutting a public street, or other yards abutting a residential development.**

Response: The off-street parking area has a five-foot yard abutting the north and west property lines. The applicant acknowledges that additional requirements to screen these as may be imposed by the reviewing body.

G. Parking and Loading Space

1. **Off-Street Parking. Parking shall be provided as set forth in Chapter 18.145 CMC.**

Response: Off-street parking will be provided in accordance with the provisions set forth in Chapter 18.145 CMC as discussed later in this narrative.

2. **Paving and Design. Off-street parking and maneuvering areas shall be paved with asphalt or concrete and designed in accordance with the standards of the off-street parking regulations of this title.**

Response: Off-street parking and maneuvering areas located within the development will be paved with asphalt and designed to meet the standards of this section.

3. **Parking Lot Landscaping. There shall be a five-foot landscaped buffer at the perimeter of all parking lot areas. Parking lots shall be designed and landscaped so as to break up large paved areas with landscaped islands, at a minimum of every 10 spaces.**

Response: A minimum 5-foot landscaped buffer is proposed at the perimeter of all parking stalls within the off-street parking area of the development. Landscape islands are incorporated into the off-street parking area, at a minimum of every 10 parking stalls. The proposed development meets the requirements of this section. See Sheet L1.0 of the Development Plans (**Exhibit E**) for further details.

18.100 Site Design Review

18.100.040 Approval criteria

In addition to the other requirements of the zoning code and other city ordinances, a project submitted for design review shall comply with the standards and criteria in subsections (A) and (B) of this section; all applications for a sign permit subject to the provisions of the sign code, Chapter 18.175 CMC, inclusive, shall comply with the rules and regulations of the committee adopted under the provisions of Division III of this title and other applicable provisions of the Cornelius Municipal Code.

A. Technical Standards. Where applicable, required off-site improvements shall be based on proportional analysis

1. **Facilities and Services. The public and private facilities and services provided by the development are adequate as to location, size, design and timing of construction in order to serve the residents or establishments to be accommodated and meet city standards and the policies and requirements of the comprehensive plan. The service provider is presumed correct in the evidence which they submit;**

Response: Adequate off-street improvements have been planned to support the proposed restaurant and associated drive-thru. The project meets the City's development standards as discussed throughout this narrative. The proposed commercial use will be located adjacent to Tualatin Valley Highway (Baseline Street and N Adair Street) within a commercial zone. The city's comprehensive plan designates most of the land adjacent to the highway for commercial purposes.

2. **Traffic Generation. Based on anticipated vehicular and pedestrian traffic generation and the standards and policies of the comprehensive plan, adequate right-of-way and improvements to streets, pedestrian ways, bikeways, transitways and other ways are provided by the development in order to promote safety, reduce congestion, conserve energy and resources, and encourage transit use, bicycling and walking. Consideration shall be given to the need for constructing, widening and/or improving, to the standards of the comprehensive plan and this code, public streets, bicycle, pedestrian, and other ways in the area of the proposed development impacted by the proposed development. This shall include, but not be limited to, improvements to the right-of-way, such as installation of lighting, signalization, turn lanes, median and parking strips, traffic islands, paving, curbs and gutters, sidewalks, bikeways, transit facilities, street drainage facilities, traffic calming devices, and other facilities needed because of anticipated vehicular, transit, bicycle, and pedestrian traffic generation. Access and street design shall comply with the standards identified in Chapter 18.143 CMC, Transportation Facilities, and Chapter 5 of the adopted public works standards. Street trees shall be installed to the standards identified in Chapter 5 of the adopted public works standards. In lieu of actual construction of off-site improvements, the committee may accept written waivers of remonstrance to the formation of local improvement districts for the purpose of providing the needed off-site improvements or cash payment to the city in an amount equal to the estimated cost of said off-site improvements;**

Response: The proposed development will include frontage improvements to both Tualatin Valley Highway (Baseline Street and N Adair Street). Frontage improvements include the installation of cobra head street lighting along Baseline Street, installation of concrete curbs, gutters, six-foot concrete sidewalks, and six-foot parkway strips with street trees along both Baseline Street and N Adair Street (East and West bound Tualatin Valley Highway) . Vehicle access and proposed frontage improvements comply with the standards identified in Chapter 18.143 CMC.

3. **Dedication. Adequate dedication or reservation of real property for public use, as well as easements and right of entry for construction, maintenance and future expansion of public facilities and services, shall be required to protect the public from any potentially deleterious effects resulting from the proposed use to fulfill the need for additional, improved services, whether on or off site, created by the proposed use, and to effect the implementation of the standards and policies of the comprehensive plan;**

Response: The applicant acknowledges this provision.

4. **Internal Circulation. There is a safe and efficient circulation pattern within the boundaries of the site. Consideration shall include the layout of the site with respect to the location, number, design and dimensions of vehicular, transit, and pedestrian access, exits, drives, walkways, bikeways, transit stops and facilities, building location and entrances, emergency equipment ways and other related on-site or off-site facilities so that there are adequate off-street parking and loading/unloading facilities provided in a safe, well designed and efficient manner. Consideration shall include the layout of parking, storage of all types of vehicles and trailers, shared parking lots and common driveways, garbage collection and storage points, as well as the surfacing, lighting, screening, landscaping, concealing and other treatment of the same. Developments shall provide a safe and reasonably direct pedestrian connection from the main entrance to the public right-of-way and/or the pedestrian system or both. The pedestrian connection shall be reasonably free of hazards from automobile traffic, so as to help encourage pedestrian and bicycle travel;**

Response: With consideration of the site's layout, the proposed internal circulation within the development is designed to be safe and efficient for both pedestrian and vehicular use. Pedestrian connections are proposed from the building entrance along the west building elevation to N Adair Street and Baseline Street. See Sheet C2.0 of the Development Plans (**Exhibit E**) for additional details.

5. **Maintenance of Private Facilities. Adequate means are provided to ensure continued maintenance and necessary normal replacement of private common facilities and areas, drainage ditches, streets and other ways, structures, recreation facilities, landscaping, fill and excavation areas, screening and fencing, ground cover, garbage storage areas and other facilities not subject to periodic maintenance by the city or other public agency. Materials, including wastes, shall be stored and managed, and grounds shall be maintained in a manner that will not attract or aid in the propagation of insects or rodents or cause a health hazard;**

Response: Adequate means will be provided to ensure continued maintenance and necessary replacement of private facilities and areas within the development. To mitigate health hazards, the waste that is created by the development's use will be properly

stored and managed in a matter that will not attract or increase numbers of insects or rodents on the site.

6. **Public Facilities. The structures and public facilities and services serving the site are designed and constructed in accordance with adopted codes and/or city standards at a level which will provide adequate fire protection and protection from crime and accident, as well as protection from hazardous conditions due to inadequate, substandard or ill-designed development;**

Response: The public facilities and services serving the site are designed and will be constructed in accordance with codes and/or city standards at a level that will provide protection from fire and criminal hazards.

7. **Security. Adequate facilities shall be provided to prevent unauthorized entries to the property, facilitate the response of emergency personnel, and optimize fire protection for the building and its occupants. Adequate facilities may include, but not be limited to, the use of lighted house numbers and a project directory for multi-unit dwelling development;**

Response: The development will provide adequate facilities to facilitate the response of emergency personnel and optimize fire protection for the building and its users.

8. **Grading. The grading and contouring of the site takes place and site surface drainage and on-site storage of surface waters facilities are constructed so there is no adverse effect on neighboring properties, public rights-of-way or the public storm drainage system and that said site development work will take place in accordance with the city site development code;**

Response: The development proposes the construction of two new stormwater facilities located at the south perimeter of the development to manage on-site stormwater. The proposed stormwater facilities will be built in accordance with the cities site development code. The proposed stormwater facilities will mitigate water drainage from the sites surface so there will be no adverse effect on neighboring properties.

9. **Utilities. Prior to the development of a site, utilities shall be extended to serve the site or financially secured for extension to serve the site. Connection to city utilities shall be required prior to final inspection and occupancy. Electric, telephone, and other utility services to new development shall be located underground. New utilities for redeveloped parcels shall be located underground from the right-of-way to the redeveloped parcels;**

Response: At time of site development utilities will be extended to serve the site. Public sanitary sewer lines already exist along the Baseline Street frontage and on the east side of 4th Avenue. Water service will be provided from 4th Avenue and sewer service will be provided from Baseline Street. See Sheet C5.0 of **Exhibit E**. The applicant will replace a substandard four-inch unlined cast iron water main along

the Baseline Frontage with an eight-inch C900 pipe. Connections will need to be made from these abutting water lines to serve the proposed fast-food restaurant.

10. **Accessibility. Access and facilities for physically handicapped people are incorporated into the site and building design with particular attention to providing continuous, uninterrupted access routes;**

Response: The site and building design incorporates accessible routes for physically handicapped people traveling in and out of the proposed development.

11. **Bicycle Lanes and Sidewalks. Where street improvements on arterials and collectors are required as a condition of development approval, they shall include bicycle lanes or off-street multi-modal pathways, and sidewalks constructed in accordance with city standards.**

Response: The frontage improvements standards for the development do not require the construction of bicycle lanes or off-street multi-modal pathways. Therefore, this provision does not apply.

B. Vehicular Access, Internal Circulation and Clear Vision Areas

1. **Relation of Building to Site. The proposed structures shall be related harmoniously to the terrain and to existing buildings which have a visual relationship to the proposed structure. Building height, bulk, lot area, coverage, setbacks, and scale should be particularly considered with regard to achieving compatible relationships. Screening, except in the industrial zone, exposed storage areas, utility buildings, machinery, service and truck loading areas, solid waste disposal cans, containers and other structures, and other accessory uses and structures, shall be adequately set back and screened. If a building is constructed, enlarged or altered to meet Type II thresholds and is located within 500 feet of a bus/transit stop, a main entrance door shall be placed on the street side of the bus/transit line and located as close as structurally possible to the bus/transit stop in compliance with this title;**

Response: The proposed development will utilize certain material in order relate the building to the surrounding buildings. See Sheet A-302 of **Exhibit E** for architectural elevations showcasing scale, building material, and building color.

2. **Trees and Vegetation. The development has been designed to, where possible, incorporate and preserve existing trees or vegetation of significant size and species. Consideration shall be given to whether habitat, survival of the tree species, and aesthetics can best be achieved by preserving groves or areas of trees as opposed to only individual trees;**

Response: The development will incorporate and preserve four of the 13 preexisting trees located on the development site. Trees proposed for retention are shown on Sheet C1.0 of the Development Plans (**Exhibit E**). The applicant has planned for the addition of 36 street trees to meet the standards of this subsection and chapter 5 of the adopted public works standards. Trees, shrubs and live ground cover are proposed throughout the project site. See Sheet L1.0 of the Development Plans (**Exhibit E**) for additional detail regarding site landscaping and street trees.

4. **Grading and contouring of the site shall take place with particular attention to minimizing the possible adverse effect of grading and contouring on the natural vegetation and physical appearance of the site;**

Response: The development does not propose major grading on the site. The preexisting contours on the site range from 176-178 feet. Proposed contours on the site are within the same range of 176-178 feet.

5. **Landscaping. The quality, location, size, and structural and aesthetic design of walls, fences, berms, traffic islands, median areas, hedges, screen planting and landscape areas are such that they serve their intended purposes and have no adverse effect on existing or contemplated abutting land uses;**

Response: The development's proposed landscaping will have no adverse effect on existing or contemplated abutting land uses. All installation and plant material meets the city public standards for landscaping.

6. **Lighting. Adequate exterior lighting shall be provided to promote public safety and shall be designed to avoid unnecessary glare upon other properties.**

Response: The development's proposed exterior lights will provide appropriate lighting and promote public safety for the development while also avoiding unnecessary glare upon other adjacent properties.

18.100.050 Special conditions

A. Technical Standards. Where applicable, required off-site improvements shall be based on proportional analysis

Response: This provision is acknowledged by the applicant.

B. Objectionable Uses. Odor, dust, smoke, fumes, noise, glare, heat, and vibration from commercial and industrial uses, or both, which might create a nuisance or be offensive to other uses in the area or be incompatible with such other uses shall be adequately eliminated or controlled by authorized measures.

Response: Within the interior of the proposed restaurant, any odor dust, smoke, fumes, noise, glare, heat, vibration, or any other nuisance seen as offensive to adjacent properties will be contained within the development.

18.143 Transportation Facilities

18.143.020 General provisions

A. All transportation facilities shall be designed and improved in accordance with the standards of this code and the adopted Cornelius public works standards. In addition, when development abuts or impacts a transportation facility under the jurisdiction of one or more other governmental agencies, the city shall condition the development to obtain permits required by the other agencies.

Response: Frontage improvements are proposed along Baseline Street, N Adair Street and 4th Avenue as reflected on Sheet C2.1 of the Development Plans (**Exhibit E**). A traffic impact analysis has been completed to address traffic impacts of the proposed development. The completed study is included as Exhibit I.

B. In order to protect the public from potentially adverse impacts of the proposal, to fulfill an identified need for public services related to the development, or both, development shall provide traffic capacity, traffic safety, and transportation improvements in proportion to the identified impacts of the development.

Response: Frontage improvements are proposed along Baseline Street, N Adair Street and 4th Avenue as reflected on Sheet C2.1 of the Development Plans (**Exhibit E**). A traffic impact analysis has been completed to address traffic impacts of the proposed development. The completed study is included as Exhibit I.

C. For applications that meet the threshold criteria of CMC 18.143.030(B), Analysis Threshold, this analysis or limited elements thereof may be required.

Response: Acknowledged. A traffic impact analysis has been completed to address traffic impacts of the proposed development. The completed study is provided as Exhibit I.

D. The decision-making authority may impose development conditions of approval per this title. Conditions of approval may be based on the traffic impact analysis.

Response: Acknowledged. A traffic impact analysis has been completed to address traffic impacts of the proposed development. The completed study is included as Exhibit I.

E. Dedication of rights-of-way shall be determined by the decision-making authority.

Response: Acknowledged.

F. Traffic calming may be approved or required by the decision-making authority in a design of the proposed and/or existing streets within the area of influence or any additional locations identified by the city engineer. Traffic calming measures shall be designed to city standards.

Response: Acknowledged. A traffic impact analysis has been completed to address traffic impacts of the proposed development. The completed study is provided as Exhibit I.

G. Intersection performance shall be determined using the Highway Capacity Manual, Sixth Edition, published by the Transportation Research Board. The city engineer may approve a different intersection analysis method prior to use when the different method can be justified. Terms used in this subsection are defined in the Highway Capacity Manual, Sixth Edition.

Response: Acknowledged. A traffic impact analysis has been completed to address traffic impacts of the proposed development. The completed study is provided as Exhibit I.

H. City street intersections shall maintain a level of service (LOS) of "D" during the p.m. peak hour of the day. An LOS of "E" may be accepted for local street approaches or driveway access points that intersect with collector or arterial streets, if these intersections are found to operate safely.

18.143.030 Traffic impact analysis.

For each development proposal that exceeds the analysis threshold of subsection (B) of this section, the application for land use or design review approval shall include a traffic impact analysis as required by this code. The traffic impact analysis shall be based on the type and intensity of the proposed land use change or development and its estimated level of impact to the existing and future local and regional transportation systems.

Response: The proposed development will generate approximately 1,488 daily trips therefore a traffic impact analysis (TIA) is required and has been prepared. The TIA was prepared by Kittelson and Associates, Inc. and was certified by engineers licensed in Oregon.

The TIA addresses applicable requirements outlined in CMC 18.143.030. The report includes the following recommendations:

- Reconstructing the site frontages along N Adair Street, N 4th Avenue, and Baseline Street;
- Placing new STOP (R1-1) signs for vehicles exiting the site at the new site access driveways onto N Adair Street and W Baseline Street;
- Placing and maintaining all vegetation and other above ground objects adjacent to the site access points to provide adequate minimum sight distance.

No off-site capacity mitigation measures were identified in the impact analysis. The TIA is included as Exhibit I.

18.143.040 Street design cross-sections per transportation system plan.

Street cross-sections include the right-of-way, paved section, sidewalk and planter strip widths. The functional classification of a street as designated in the transportation system plan shall determine its design and width. Identification of functional classifications for streets in the city limits is found in the adopted Cornelius transportation system plan. Street design standards, which are based on functional classification and use, are found in the adopted Cornelius public works standards. Full street connections shall be provided at intervals consistent with the adopted Cornelius public works standards for the identified street classification, except as modified by Chapter 18.115 CMC, or where prevented by topography, barriers such as railroads or freeways, or environmental constraints such as major streams and rivers.

A. Deviations to Adopted Street Cross-Sections. A deviation from the adopted street cross-sections and/or widths or both shall require demonstration of a hardship or other exceptional circumstances resulting from conditions of the property. Hardship or exceptional circumstances may include, but are not limited to, unique topographic conditions, environmental protection requirements, and existing development and buildings. A request for a deviation shall comply with this title and, where applicable, the transportation planning rule

Response: Frontage improvements are proposed along Baseline Street, N Adair Street and 4th Avenue as reflected on Sheet C2.1 of the Development Plans (**Exhibit E**). The design is consistent with the standards, no deviations are proposed.

18.143.050 Access standards.

Access standards establish requirements and regulations for safe and efficient vehicle access to and from a site and enhance general circulation within a site.

A. Access Spacing. Access spacing shall be designed in conformance with the adopted Cornelius public works standards.

1. State and County Facilities. Access to state (ODOT) and/or Washington County facilities or both requires approval from those agencies. Traffic analyses shall meet ODOT and county requirements, in addition to those of the city for a traffic impact analysis.

Response: A traffic impact analysis is underway to address traffic impacts of the proposed development and the provisions of section 18.143.050 access standards. The completed study will be provided at a future date. The applicant will need to gain permission from ODOT for the proposed access onto Baseline Street and N Adair Street. Confirmation of ODOT review of the project will be provided at a future date.

B. Access Spacing. Access spacing shall be designed in conformance with the adopted Cornelius public works standards.

Response: Spacing of both access points into the site are designed in conformance with public works standards see Sheet C2.0 in **Exhibit E.**

C. Driveway/Access Points. The location and number of driveways or access points have a direct effect on safe and efficient traffic flow. The following access management standards shall apply toward new driveways:

1. **Driveway spacing shall be designed in accordance with adopted public works standards. In some cases, driveway setbacks may be greater than the standard depending upon the influence area, as determined by city engineer review of a traffic impact report submitted by the applicant's traffic engineer. If the subject property has less than 150 feet of street frontage, the applicant shall first investigate a shared access as an option. If a shared access is not possible, the driveway shall be placed as far from the intersection as possible.**

Response: Spacing of both access points into the site are designed in conformance with public works standards see Sheet C2.0 in **Exhibit E.**

2. **Based on the applicants' proposal and its compliance with the comprehensive plan, transportation system plan and the development and zoning code, the city shall require the closing or consolidation of existing driveways or other vehicle access points, the recording of reciprocal access easements (i.e., for shared driveways), and installation of traffic control devices or other measures as a condition of approval to mitigate the impacts of the development.**

Response: Acknowledged. Existing driveways along 4th Avenue will be removed as part of this development. New access locations are proposed along Baseline Street and N Adair Street.

3. **New developments shall provide cross-over easements to ensure potential shared driveway access points where existing conditions (i.e., surrounding land uses, lot configurations, physical characteristics, etc.) warrant consideration.**

Response: Cross-over easements are not necessary as there is no shared access proposed.

4. **Access to arterials shall only be from public streets. When a site that has private access onto a principal arterial is redeveloped, the private access shall be eliminated if alternate access exists or can be developed to the site.**

Response: Access is proposed via Baseline Street and N Adair Street, both classified as arterials. The applicant will need to gain permission from ODOT for the proposed access onto Baseline Street and N Adair Street. Confirmation of ODOT review of the project will be provided at a future date.

5. **Direct access to a collector street shall only be considered if there is no alternative way to access the site. If direct access is permitted by the city, the applicant shall be required to mitigate for**

any safety or neighborhood traffic management impacts deemed applicable by the city engineer. In no case shall the design of driveways, drive aisles or service drives require or encourage the backward movement or other maneuvering of a vehicle within a street, except for single-family and duplex residences.

Response: Access is proposed via Baseline Street and N Adair Street, both classified as arterials therefore this section is not applicable.

6. **Proposed shared-use paths shall be located to provide access to existing or planned commercial services and other neighborhood facilities, such as schools, shopping areas and park and transit facilities. To the greatest extent possible, access shall be reasonably direct, providing a route or routes that do not deviate unnecessarily from a straight line or that do not involve a significant amount of out-of-direction travel.**

Response: Shared use paths are not proposed, nor are they believed to be required.

18.143.060 Transit supportive amenities.

A. New commercial, industrial and institutional buildings developed on sites adjacent to major transit stops shall provide transit-related improvements. Major transit stops are identified as part of the regional transit system or as otherwise defined in Chapter 18.195 CMC. Properties are considered "at" a major transit stop when they are within 200 feet of the stop. A proposed development that is adjacent to or includes an existing or planned major transit stop will be required to plan for access to the transit stop and provide for transit improvements, in consultation with TriMet and consistent with an agency adopted or approved plan at the time of development. Requirements apply where the subject parcel(s) or portions thereof are within 200 feet of a major transit stop. Development requirements and improvements may include the following:

Response: TriMet bus line 57 runs along Tualatin Valley Highway through the City of Cornelius. Existing bus stops are located on the north side of west bound TV Highway (N Adair Street) and the south side of east bound TV Highway (Baseline Street) near the N 4th Avenue intersection, however neither bus stop is along the subject site's frontage. Transit supportive amenities are therefore anticipated for this project.

18.143.070 Intelligent transportation systems.

Intelligent transportation systems (ITS) manage and enhance operational performance through advanced technologies and management techniques to help relieve congestion, promote safety and provide suitable transportation strategies.

To provide for efficient installation of future intelligent transportation systems (ITS), all roadway improvement projects, including private development with frontage improvements, shall install three-inch conduit to support local

interconnect infrastructure. The location, design and type of conduit shall be approved by the city engineer.

Response: Acknowledged.

18.145 Off-Street Parking and Loading

18.145.010 General Provisions

A. The provision and maintenance of off-street parking and loading spaces are continuing obligations of the property owner. No building or other permit shall be issued until plans are presented that show property that is and will remain available for exclusive use as off-street parking and loading space as required by this title. The subsequent use of property for which the building permit is issued shall be conditional upon the unqualified continuance and availability of the amount of parking and loading space required for the specific use. Use of property in violation of the off-street parking and loading requirements located herein shall be a violation of this code. Should the owner or occupant of a lot or building change the use to which the lot or building is put, thereby increasing off-street parking or loading requirements, it shall be a violation of this code to begin or maintain the altered use until the required increase in off-street parking or loading is provided, except as provided in the central mixed use (CMU) and corridor commercial (CC) zoning districts (see CMC 18.145.020(C)).

Response: The applicant has provided plans that show property within the development area that will be used exclusively as off-street parking and loading for the restaurant use.

B. Unless otherwise provided, required parking and loading spaces shall not be located in a required yard.

Response: Proposed parking and loading areas are not located within a required yard. There is a 5-foot landscaped buffer at the perimeter of all parking stalls within the off-street parking area of the development.

C. Owners of two or more uses, structures, or parcels of land may agree to utilize jointly the same parking and loading spaces when the hours of operation do not overlap; provided, that satisfactory legal evidence is presented to the community development director in the form of deeds, leases, or contracts to establish the joint use.

Response: The property will be developed for a single user therefore shared parking or joint parking facilities are not proposed.

D. A plan drawn to scale, indicating how the off-street parking and loading requirement is to be fulfilled, shall accompany the request for a building permit, site plan review, or certificate of occupancy. The plan shall show all those elements necessary to indicate that these requirements are being fulfilled and shall include but not be limited to:

1. **Delineation of individual parking and loading spaces and their dimensions;**

2. **Circulation area necessary to serve spaces;**

3. **Access to streets, alleys and properties to be served;**

4. **Curb cuts;**

5. **Location and dimensions of all landscaping, including the type and size of plant material to be used, as well as any other nonliving landscape material incorporated into the overall plan, excluding single- and two-family residences and multi-family uses with not more than four units in the core residential zone; and**

6. **Specifications as to signs and bumper guards, excluding single- and two-family residences and multi-family uses with not more than four units in the core residential zone.**

Response: The applicant has provided a site plan drawn to scale that reflects proposed off-street parking and a landscape plan showing proposed landscaping within the site. This development does not propose residential uses.

E. Requirements for types of buildings and uses not specifically listed herein shall be determined by the community development director, based upon the requirements of comparable uses listed.

Response: The requirements for commercial fast-food restaurant use is specifically listed in code section 18.145.030(A).

18.145.020 Off-Street Parking

A. At the time of erection of a new structure or at the time of enlargement or change in use of an existing structure within any zone in the city, off-street parking spaces shall be provided in accordance with CMC 18.145.030. If parking space has been provided in connection with an existing use or is added to an existing use, the parking space shall not be eliminated if elimination would result in less space than is specified in the standards of this section when applied to the entire use. In cases of enlargement of a building or use of land existing on the effective date of the ordinance codified in this title, the number of parking spaces required shall be based only on floor area or capacity of such enlargement.

Response: New off-street parking areas meet the requirements from code section 18.145.030 as discussed later in this narrative.

B. Where square feet are specified, the area measured shall be the gross floor area primary to the functioning of the particular use of the property but shall exclude space devoted to off-street parking or loading. Where employees are specified, persons counted shall be

those working on the premises during the largest shift at the peak season, including proprietors.

Response: The gross floor area of the building is 4,855 square feet and is determined to be the area primary to the functioning of the particular use.

C. In the central mixed use and corridor commercial zoning districts, change of use of an existing commercial structure will not require additional parking to be constructed. However, construction of a new building or addition to an existing building will require the provision of off-street parking as required in CMC 18.145.030.

Response: The development proposes the construction of a new fast-food restaurant. The development meets the required provisions for off-street parking listed in CMC 18.145.030.

D. If several uses occupy a single structure or parcel of land, the total requirements for off-street parking shall be the sum of the requirements of the several uses computed separately with a reduction of 10 percent to account for cross-patronage and shared parking benefits. Where the peak hours of operation of two or more uses do not substantially overlap, such uses may share off-street parking spaces as required by this title.

Response: The proposed development will be occupied by only one use. Therefore, this provision does not apply.

E. Parking spaces in public streets or alleys shall not be eligible as fulfilling any part of the parking requirements, except as allowed in the central mixed use and core commercial zoning districts.

Response: The development only consists of off-street parking options. Therefore, this provision does not apply.

F. Required parking spaces shall be available for the parking of operable motor vehicles for residents, customers, patrons, and employees only, and shall not be used for the storage or sale of vehicles or other materials and shall not be rented, leased or assigned to any other person or organization not using or being directly served by the use.

Response: The required off-street parking spaces within the development will only be available to operable motor vehicles for customers, patrons, and employees.

G. Off-street parking spaces for dwellings shall be located on the same lot with the dwelling, unless specified elsewhere in the code.

Response: The proposed development will not include residential dwellings. Therefore, this provision does not apply.

18.145.030 Required off-street parking spaces

A. Off-street parking shall be provided based on the primary use of the site according to the following standards and regardless of the parking zone in which the use is located

Table 1
Minimum and Maximum Required Off-Street Vehicle and Bicycle Parking Requirements
(unless otherwise noted, standard is per 1,000 sf of gross floor area)

Land Use	Minimum Parking Standards	Maximum Parking Standards		Minimum Bicycle Parking Standards
		Zone A	Zone B	
COMMERCIAL				
Commercial Lodging	1.0/room	1.2/room	1.4/room	1.0/10 rooms
Eating and Drinking Establishments	fast food: 9.9/1,000 other: 15.3/1,000	12.4/1,000 19.1/1,000	14.9/1,000 23/1,000	All: 1.0/1,000
Self-Service Storage	1/5,000 sf up to 20,000 sf; 1/20,000 sf thereafter	none	none	1/50,000 sf

Response: The project includes a 4,855 square foot building and a 1,185 square foot covered outdoor dining area, for a total combined square footage of 6,040 for the restaurant use. Per Table 1 above, the use is required to have a minimum of 60 parking stalls and a maximum of 75 parking stalls. As reflected on the Site Plan (Sheet C2.0 of **Exhibit E**), the applicant proposes a total of 74 parking spaces to serve the development.

B. All uses providing drive-in service as defined by this title shall provide on the same site a reservoir for inbound vehicles as follows:

Land Use	Reservoir Requirement
Drive-In Banks	5 spaces/service terminal
Drive-In Restaurants	10 spaces/service window

Response: The applicant proposes 20 spaces for service window one and 18 spaces for service window two, meeting the minimum requirements for a drive-in restaurant vehicle reservoir stated in the table above. See Sheet C2.0 of the Development Plans (**Exhibit E**) for additional details regarding vehicle queuing lengths within the drive-thru lanes.

18.145.040 Off-street loading

A. Buildings and structures to be built or substantially altered which receive and distribute material or merchandise by truck shall provide and maintain off-street loading space as follows:

Table 2 Off-Street Loading Requirements	
Land Use	Loading Space Required
Commercial	
Floor Area:	
Under 5,000 sq ft	0
5,000 to 25,000 sq ft	1
25,000 to 50,000 sq ft	2
50,000 to 100,000 sq ft	3

Table 3 Minimum Loading Berth Dimensions		
Land Use	Length – Linear Feet	Width – Linear Feet
All uses except wholesale and industrial	35	12
Wholesale storage and industrial	65	12

Response: The applicant does not include loading spaces within the proposed development**.** The floor area of the proposed commercial restaurant is under 5,000-square-feet, however, the covered outdoor seating area increases total square footage of the use to 6,055 square feet. The applicant is seeking a modification to the loading requirements pursuant to section 18.145.040.E. See response to the section below.

E. The facilities review committee may modify the off-street loading requirements as they apply to any individual case only for good cause shown, and it shall set reasonable safeguards and conditions to ensure that any such modification conforms to the intent of this title. Modification may be granted if it is demonstrated to the satisfaction of the committee that loading operations of the use or structure in question will not interfere with pedestrian or vehicular traffic on a public street.

Response: The proposed use does not require a formal loading area. Supplies will be delivered to the site during non-business hours and will utilize the proposed parking lot for truck parking and maneuvering for deliveries. Adjacent public roadways will not be affected by on-site delivery operations. See truck turning diagram (**Exhibit G**) for confirmation that adequate space is provided within the site for deliveries**.**

18.145.050 Design and maintenance standards for off-street parking and loading facilities.

A. Except as otherwise defined in this code, "one standard parking space" means a minimum of a parking stall of nine feet in width and 20 feet in

length. To accommodate compact cars more efficiently, up to 25 percent of the available parking spaces may have a minimum dimension of eight feet in width and 16 feet in length, so long as they are identified as compact car stalls and are not readily accessible to large cars.

Response: Off-street parking spaces within the proposed development will be nine feet in width and 20 feet in length consistent with standard parking space standards.

B. Excluding detached single-unit dwellings and middle housing residences, groups of two or more parking spaces shall be served by a service drive so that no backing movements or other maneuvering within a street or other public right-of-way would be required.

Response: The proposed off-street parking within the development will be served by internal drive aisles ranging from 24 to 28 feet in width that will allow for full vehicular movements so that vehicles will not need to back onto or maneuver within a public right-of-way in order to enter or exit the site.

C. Service drives shall be designed and constructed to facilitate the flow of traffic, provide maximum safety of traffic access and egress consistent with CMC 18.150.070, and maximum safety of pedestrians and vehicular traffic on the site.

Response: Minimum 24-foot internal drive aisles are proposed within the off-street parking area of the development. They are designed to maximize safety and facilitate pedestrians and vehicular traffic through the site, consistent with this provision.

D. Each parking and/or loading space shall be accessible from a street and the access shall be of a width and location as described in this section.

Response: The proposed off-street parking within the development will be accessible from both N Adair Street and Baseline Street. Both access points are 24 feet in width, meeting the minimum unobstructed pavement width standards described in section 18.45.060.B.

E. Parking space configuration, stall and access aisles shall be of sufficient width for all vehicles turning and maneuvering.

Response: Off-street parking stalls within the proposed development will be nine feet in width and 20 feet in length in accordance with section 18.145.050.A. The internal circulation routes within the development meet the minimum unobstructed pavement width standards (24 feet) within section 18.45.060.B.

F. Except for detached, single-unit dwellings and middle housing residences, any area intended to be used to meet the off-street parking requirements as contained in this title shall have all parking spaces clearly marked using a permanent paint. All interior drives and access aisles shall be clearly marked and signed to show direction of flow and maintain vehicular and pedestrian safety.

Response: The proposed off-street parking spaces within the development will be clearly marked with permanent paint. To maintain vehicular and pedestrian safety, all interior access aisles will be clearly marked to show the direction of traffic flow within the development. See Sheet C2.0 of the Development Plans (**Exhibit E**) for additional details.

G. Except for detached, single-unit dwellings and middle housing residences, all areas used for the parking and/or storage and/or maneuvering of any vehicle, boat and/or trailer shall be improved with asphalt or concrete surfaces according to the same standards required for the construction and acceptance of city streets. Off-street parking spaces for residential development with not more than four units in the core residential zone shall be improved with an asphalt or concrete surface to specification as approved by the building official.

Response: Following the same standards required for the construction of city streets, the proposed off-street parking area within the development will be paved with asphalt.

H. Parking spaces along the outer boundaries of a parking lot or adjacent to interior landscaped areas or sidewalks shall be provided with a wheel stop at least four inches high located three feet back from the front of the parking stall. The facilities and design review committee or the planning commission may approve parking spaces without wheel stops, provided the abutting sidewalk is increased by three feet in width and/or the appropriate landscaping is planted where the bumper would overhang.

Response: Each parking space located adjacent to the proposed interior landscaped areas or sidewalks will have a continuous curb to protect adjacent sidewalks and landscaping areas. See Sheet C2.0 of the Plan Set (**Exhibit E**) for additional details.

I. Off-street parking and loading areas shall be drained in accordance with specifications approved by the city engineer.

Response: The development proposes the construction of two new stormwater facilities located at the south perimeter of the development. The proposed stormwater facilities will be built in accordance with the cities site development code. The proposed stormwater facilities will mitigate water drainage from the sites impervious surfaces.

J. Artificial lighting on all off-street parking facilities shall be designed to deflect all light away from surrounding residences and so as not to create a hazard to the public use of any road or street.

Response: All exterior lighting proposed is oriented away from surrounding residences and public roads. See the Photometric Plan on Sheet EP1.0 of the Plan Set **(Exhibit E)**) for additional details regarding site lighting.

K. Signs which are provided on parking lots for the purpose of meeting this section shall be as prescribed by the building official.

Response: Any signs provided for the internal parking lot will be consistent with those prescribed by the building official.

L. All parking lots shall be kept clean and in good repair at all times. Breaks in paved surfaces shall be repaired promptly, and broken or splintered wheel stops shall be replaced so that their function will not be impaired.

Response: The applicant will keep parking areas within the development clean and in good repair. If repairs are needed, they will be made promptly.

M. Bicycle parking spaces shall be conveniently located with respect to the street, bicycle path/lane and building entrance. Bicycle parking spaces shall not conflict with off-street vehicle parking spaces and drive aisles. There shall be at least 36 inches of clearance between parked bicycles and other obstructions or buildings.

Response: Bicycle parking spaces are placed 36 inches away from the western facade of the proposed restaurant in a way that does not conflict with off-street parking vehicle parking and drive isles. The location of proposed bicycle parking is shown on Sheet C2.0 of the Plan Set (**Exhibit E**).

1. Short-Term Bicycle Parking. Short-term bicycle parking shall be provided to encourage shoppers, customers, and other visitors to use bicycles by providing a convenient and readily accessible place to park bicycles.

a. Short-term bicycle facilities shall be in the form of either a lockable enclosure or a stationary rack, either covered or uncovered, to which the bicycle can be locked.

b. Short-term bicycle facilities shall be located within 30 feet of the main entrance to the building, in a location that is easily accessible for bicycles.

c. Short-term bicycle facilities may be located within the right-of-way adjacent to the street frontage of a property within the central mixed use and core commercial districts if approved by the city engineer.

Response: The proposed development will provide five short-term bicycle facilities in the form of two bicycle racks. These short-term bicycle racks will be located 20 feet from the main entrance. See Sheet C2.0 of the Plan Set (**Exhibit E**) for additional details.

18.145.060 Landscaping required

A. Purpose. The purpose of this section is to improve the appearance of off-street parking and open lot sales and services areas in Cornelius and to protect and preserve the appearance, character, and value of the surrounding neighborhoods and thereby promote the general welfare by providing for installation and maintenance of landscaping for

screening, buffering and aesthetic qualities, finding that the particular characteristics and qualities of Cornelius justify regulations to perpetuate its aesthetic appeal on a city-wide basis. It is also the purpose of this section to allow for increased seepage by providing openings in the impervious surface, increased safety by breaking up large expanses of pavement, and increased shading to reduce overheating of car interiors, and reduce glare and radiation from large numbers of vehicles.

Response: The applicant acknowledges this provision.

B. Minimum Requirements. All areas used for the display and/or parking of any and all types of vehicles, trailers, boats or heavy construction equipment, whether such vehicles traverse the property as a function of the primary use, hereinafter referred to as "other vehicular uses," shall conform to the minimum landscaping requirements provided in this section. Activities that are of a drive-in nature such as, but not limited to, filling stations, grocery and dairy stores, banks, restaurants, and the like shall conform to the minimum landscaping requirements also.

Response: The development is subject to the minimum landscaping requirements set forth in this code.

C. Installation. All landscaping shall be installed in a sound workmanship-like manner and according to accepted good planting procedures with the quality of plant materials as hereinafter described. All elements of landscaping exclusive of plant material except hedges shall be installed so as to meet all other applicable ordinances and code requirements. Landscaped areas shall require protection from vehicular encroachment as herein provided in CMC 18.145.050(H). The community development director or the building official shall inspect all landscaping and no certificates of occupancy or similar authorization will be issued unless the landscaping meets the requirements herein provided.

Response: All landscaping will be installed to meet all other applicable ordinances and code requirements. All landscaped areas located with the development will be protected from vehicular encroachment using required curbs.

D. Maintenance. The owner, tenant and their agent, if any, shall be jointly and severally responsible for the maintenance of all landscaping which shall be maintained in good condition so as to present a healthy, neat and orderly appearance and shall be kept free from refuse and debris. All plant growth in interior landscaped areas shall be controlled by pruning, trimming or otherwise so that:

1. **It will not interfere with the maintenance or repair of any public utility;**

2. **It will not restrict pedestrian or vehicular access; and**

3. **It will not constitute a traffic hazard because of reduced visibility.**

Response: The landscaping within the development will be maintained to present an orderly and healthy appearance throughout the development. All plant growth located in interior landscaped areas will be controlled by pruning and trimming so that it does not become a restriction or safety hazard.

18.145.070 Parking lot design standards

A. Required Landscaping Adjacent to Public Right-of-Way. A strip of land at least five feet in width located between the abutting right-of-way and the off-street parking area or vehicle use area which is exposed to an abutting right-of-way, except in required vision clearance areas as provided in CMC 18.150.070.

Response: The landscaping within the development includes a five-foot strip of land located between the abutting right-of-way of North Adair Street and the off-street parking area on the north boundary of the development.

B. Perimeter Landscaping Relating to Abutting Properties. On the site of a building or structure or open lot use providing an off-street parking area or other vehicular use area, where such areas will not be entirely screened visually by an intervening building or structure from abutting property, a five-foot landscaped strip shall be between the common lot line and the off-street parking area or other vehicular use area exposed to abutting property.

Response: A minimum five-foot-wide landscaping area is proposed around the perimeter of the site except in the location of driveways. A combination of tree, shrubs and groundcover are proposed in the landscaping area along the west property line adjacent to the neighboring commercially zoned parcel thus screening that parcel from view of the parking area.

C. Where the boundary of a parking lot in a nonresidential zone adjoins a residential district, a 10-foot landscaped strip shall be provided along the entire length abutting the residential zone, and shall be landscaped with evergreen plant material and maintained at a minimum height of 36 inches.

Response: There are no residential districts abutting the site. Therefore, this provision does not apply.

D. Parking Area Interior Landscaping. Landscaped islands shall be provided a minimum of every 10 parking spaces with a depth equivalent to the depth of the adjacent parking spaces and a minimum width of six feet to break up large expanses of pavement, improve the appearance and climate of the site, improve safety, and delineate pedestrian walkways and traffic lanes. Except for industrial development within industrial zones, the following interior landscaping shall be met:

1. **Sight Distance for Landscaping at Points of Access. When an accessway intersects a public right-of-way or when the subject**

property abuts the intersection of two or more public rights-of-way, all landscaping within vision clearance areas pursuant to CMC 18.150.070 shall provide unobstructed cross-visibility at a level between three feet and 10 feet above the curb line; provided however, visibility areas shall be allowed, provided they are so located so as not to create a traffic hazard. Landscaping except required grass or ground cover shall not be located closer than three feet from the edge of any accessway pavement.

Response: In accordance with the vision clearance standards, the clear vision zones established on the development access points have no structures that impede visibility. See Sheet C2.0 of the Plan Set (**Exhibit E**) for vision clearance dimensions.

2. **Parking lots that are more than three acres in size shall provide street features along major drive aisles. These features shall include at a minimum curbs, sidewalks and street trees and/or planter strips or both.**

Response: The proposed off-street parking lot will be significantly under three acres in size. Therefore, the requirements of this provision do not apply to this development.

3. **Access to and from parking spaces/areas shall not permit backing onto a public street and/or a public vehicle travel lane or both, except for single-family or duplex dwellings and multi-family uses with not more than four units in the core residential zone.**

Response: The proposed off-street parking within the development will be served by minimum 24-foot internal drive aisles that will allow for full vehicular movements so that vehicles will not need to back onto or maneuver within a public right-of-way in order to enter or exit the site.

18.145.080 Drainage of off-street parking and loading facilities.

Off-street parking and loading facilities shall be drained to avoid flow of water across public sidewalks.

Response: The development proposes the construction of two new stormwater facilities located at the south perimeter of the development. The proposed stormwater facilities will be built in accordance with the cities site development code. The proposed stormwater facilities will manage water drainage from the sites impervious surfaces so there will be no adverse effect on neighboring properties or public sidewalks. A storm plan is included as Sheet C4.0 of the Development Plans (**Exhibit E**) and a Preliminary Drainage Report is included as **Exhibit H**.

18.145.090 Security required

A. **Completion Time for Parking Lots. Required parking spaces shall be improved and available for use before the final inspection. An extension of time may be granted by the community development director, provided a security equal to 150 percent of the cost of the parking lot is**

posted with the city of Cornelius and the parking space is not required for immediate use. If the parking improvements are not completed within six months, the city shall have access to the security to complete the installation and/or revoke occupancy. Upon completion of the installation, any portion of the remaining security shall be returned to the owner. Costs in excess of the posted security shall be assessed against the property and the city shall thereupon have a valid lien against the property, which shall become due and payable.

Response: The applicant acknowledges this provision.

18.150 Special Use Regulations

18.150.070 Clear vision zones.

Except in the central mixed use (CMU) zoning district, a clear vision zone shall be maintained on the corners of all property adjacent to the intersection of two streets, a street and a railroad, or a driveway providing vehicular access to a public street.

A. The clear vision zone is defined as the triangular area beginning at the intersection of the projected curb lines, and extending 15 feet along the leg of each intersection. No fence, berm, wall, hedge or other planting or structure shall be placed within the clear vision zone that would impede visibility between a height of 30 inches and 10 feet as measured from the top of curb, or in the absence of a curb, from the established street center line grades. If the relation of the surface of the lot to the streets is such that visibility is already obscured, nothing shall be done to increase the impediment to visibility within the vertical and horizontal limits set forth above. Poles, tree trunks, and similar objects less than 12 inches in width may be allowed in the clear vision zone if they meet the vertical requirements noted above.

Response: Within the clear vision zones established on the development access points, the applicant has proposed no structures that might impeded visibility. See Sheet C2.0 of the Plan Set (**Exhibit E**) for vision clearance dimensions.

B. A private access shall be treated as a public street for the purpose of this section. The edge of the paved surface area of the private access, be it roadway, curb or sidewalk, shall be treated as the curb line in determining the vision clearance zone.

Response: The applicant acknowledges this provision when determining the developments vision clearance zones.

C. The requirements of visibility at intersections in the CMU zoning district shall be determined on a case-by-case basis by the facilities and design review committee in accordance with traffic and transportation engineering standards.

Response: The development is not located within a CMU zone. Therefore, this provision does not apply.

18.155 Solar Access for New Development

18.155.050 Shading

A. The physical elements of the development plan shall be, to the maximum extent feasible, located and designed so as not to cast a shadow onto structures on adjacent property greater than the shadow which would be cast by a 25-foot hypothetical wall located along the property lines of the project between the hours of 9:00 a.m. and 3:00 p.m., PST, on December 21st.

Response: The subject site is surrounding by public roadways on three sides. An existing residential structure is located west of the site. The proposed building is situated along the east property line approximately 280 feet from the west property line and thus will not cast a shadow onto the adjacent residential structure.

Landscaping is proposed along the west property and within the parking lot adjacent to the residence as follows:

- A six-foot-high black chain link fence and evergreen hedge comprised of shrubs is proposed along the site boundary to comply with screening standards. The selected vegetation will be maintained to a minimum height of six feet and maximum height of eight feet and therefore will not present a greater shadow than a 25-foot hypothetical wall located at the property line.

- Trees proposed within landscape islands in the parking lots will reach a mature height of 25 feet, however, they are set back approximately 15 feet from the property line and therefore they will not present a greater shadow than a 25-foot hypothetical wall located at the property line.

- A street tree is proposed at the southwest corner of the site. It is within 9.5 feet of the property and will have a mature height of 30 feet. However, the street tree is adjacent to the existing driveway not the residential structure therefore it is not expected to cause shade on the home.

B. The impact of trees shall be evaluated on an individual basis considering the potential impacts of the shading and the potential adverse impacts that the shading could create for the adjacent properties in terms of blocking sunlight in indoor living areas, outdoor activity areas, gardens, and similar spaces benefiting from access to sunlight.

Response: Landscaping is proposed along the west property and within the parking lot adjacent to the residence as follows:

- A six-foot-high black chain link fence and evergreen hedge comprised of shrubs is proposed along the site boundary to comply with screening standards. The selected vegetation will be maintained to a minimum height of six feet and maximum height of eight feet and therefore will not present

a greater shadow than a 25-foot hypothetical wall located at the property line.

- Trees proposed within landscape islands in the parking lots will reach a mature height of 25 feet, however, they are set back approximately 15 feet from the property line and therefore they will not present a greater shadow than a 25-foot hypothetical wall located at the property line.

- A street tree is proposed at the southwest corner of the site. It is within 9.5 feet of the property and will have a mature height of 30 feet. However, the street tree is adjacent to the existing driveway not the residential structure therefore it is not expected to cause shade on the home.

18.175 Signs

Response: Signs are not proposed as a part of this preliminary land use application. The existing billboard sign on tax parcel 1N333CC02400 will be removed as part of the development. The Applicant will pursue separate sign permits at a future date as necessary.

4.0 CITY OF CORNELIUS PUBLIC WORKS STANDARDS

The applicable standards are set forth below with responses demonstrating the project's consistency with these standards.

Chapter 5 Streets

5.11 Landscaping

5.11.a General

Street trees provide a number of important functions besides making a neighborhood more attractive. Some of these functions include: reducing stormwater runoff and erosion, keeping urban areas cooler, providing food and shelter for wildlife, capturing airborne pollutants, and slowing traffic in corridors lined with trees. These functions are maximized when street trees form a canopy over the street. Therefore, street trees should be selected with an eye toward their ability to form a canopy over the streets in Cornelius.

These standards provide much flexibility in selecting street trees. The flexibility is intended to promote diversity in the tree canopy and avoid a disease wiping out all trees in parts of the City where single species of trees are planted along parkway strips.

Response: The applicant has planned for the addition of 36 various street trees in accordance with chapter 5 of the adopted public works standards. 19 street trees will be located evenly spaced along the south frontage of North Adair Street. The street trees along North Adair Street include eight different species. 13 trees will be located evenly spaced along the north frontage of Baseline Street. The street trees along

Baseline Street include eight different species. Eight trees will be located evenly spaced along the west frontage of North 4th Avenue. The street trees along North 4th Avenue include 12 different species. See Sheet L1.0 and L1.1 of the Development Plans (**Exhibit E**) for further details regarding location, size and species of street trees.

5.11.b Approval

Planting trees in the public right-of-way requires City approval. Unless the activity is part of a larger project requiring engineering plan approval, the Public Works Permit is the vehicle to use for approving tree plantings in the right-of-way.

The primary information required for City approval is identification of the type of tree(s) to be planted and their locations. City staff then evaluates the information to ensure the proposed plantings meet the standards in this section.

Response: The proposed development requires there to be frontage improvements along the abutting roads. These frontage improvements include the planting of numerous street trees. The proposed street trees to be planted along the street frontages meet the standards in this section. See Sheet L1.0 and L1.1 of the Development Plans (**Exhibit E**) for further details regarding location, size and species of street trees.

5.11.c Street Tree Types

1. **The required characteristics of street trees include:**
    - **Relatively disease free and tolerates urban pollutants**
    - **Medium to tall tree, except under overhead utility lines**
    - **Non-fruit bearing**
    - **Deep rooted**
    - **Long-lived**
    - **Ability to thrive in our climate**
    - **Likelihood that tree can form a canopy over the street**
2. **Examples of acceptable trees are:**
    - **Red oak**
    - **Ginkgo (male only)**
    - **Douglas Fir**
    - **Incense cedar**

- **Zelkova**
- **Marshall Ash**

Response: The proposed street trees meet the required characteristics listed in this subsection.

3. **Evergreen trees are acceptable as street trees in locations where they do not block vision or access.**

Response: The proposed evergreen trees on the street frontages are in locations where they do not block vision or access to and from the site.

4. **Acceptable trees are those on the appropriate City of Portland Approved Street Tree Planting Lists (http://www.portlandoregon.gov/trees/66682). The Portland lists are broken into groups based on width of parkway strips and whether overhead utility lines exist above the planting area.**

Response: All proposed street trees abutting the development are in accordance with the City of Portland Approved Street Tree Planting List.

5.11.d Density and Diversity

To create diversity these standards implement the 10-20-30 guidelines from Frank Santamour. This guideline dictates that no more than 10% of any species, no more than 20% of any genus, and no more than 30% of any family is planted in an area.

1. **For projects required to plant 10 or more street trees, the planting list shall include:**
    - **A maximum of 10% of any species, or a minimum of 10 different species**
    - **A maximum of 20% of any genus, or a minimum of trees from 5 different genera**
    - **A maximum of 30% of any family, or a minimum of trees from 4 different families**

Response: The proposed landscaping includes 10 different species, five different genera and four different families meeting minimum density and diversity requirement of this section. See notes on Sheet L1.0 of the Development Plans (**Exhibit E**).

2. **For projects required to plant 5 to 9 street trees, the planting list shall include:**
    - **All trees of a different species**
    - **All trees of a different genus**
    - **All trees of a different family**

3. **For projects required to plant less than 5 street trees, the trees shall all be from different genera. In other words, if 3 trees are to be planted, they should represent trees from 3 unique genera.**

4. **Street trees shall be planted in a diverse pattern. The interval between planting identical street trees shall be equal to half the number of different trees in the planting list. For example, if the planting list contains 12 different trees including a Red Oak, then Red Oaks can be planted no closer than every 6th tree along a street.**

Response: The proposed street trees are in accordance with the diverse pattern described in this provision. See notes on Sheet L1.0 of the Development Plans (**Exhibit E**).

5. **Trees should be planted approximately 12 to 30 feet apart. The distance depends on the ultimate size of trees.**

Response: The proposed street trees are planted 17-30 feet apart from each other in accordance with this provision. See proposed planting layout on Sheet L1.0 of the Development Plans (**Exhibit E**).

5.11.e Size Requirements

The following size requirements are based on caliper size (diameter 12" above the ground) rather than DBH (diameter at breast height) because nurseries typically measure trees in caliper size.

For young trees, caliper size and DBH will be nearly the same. Only as trees get older and the bottom of the trunks flare out will caliper size start to differ significantly from DBH.

1. **Broadleaf trees planted in single-family and duplex neighborhoods, shall be a minimum caliper size of 1.5".**

2. **Broadleaf trees planted in other than single-family and duplex neighborhoods shall be a minimum caliper size of 2".**

3. **Conifers must be a minimum 5 feet in height at time of planting.**

Response: In accordance with this provision, proposed broadleaf trees are a caliper size of 2" and are at least 5 feet tall when planted. See details on Sheet L1.1 of the Development Plans (**Exhibit E**).

5.11.f Location Restrictions

1. **Street trees shall generally be planted in parkway strips. Where a parkway strip does not exist, such as in locations where a sidewalk is adjacent to a parking bay, then street trees shall be planted on the opposite side of the sidewalk from the street or in tree grates where the sidewalk is sufficiently wide. Trees planted outside the right-of-way shall be protected in an easement.**

2. **The minimum distance between new street trees and fire hydrants or utility pedestals shall be 5 feet.**

3. **New street trees shall be planted a minimum of 10 feet from directional traffic signs and utility poles.**

4. **New deciduous street trees shall be planted a minimum of 15 feet from stop signs and yield signs.**

5. **New evergreen street trees shall be planted a minimum of 20 feet from stop signs and yield signs.**

6. **New street trees shall be planted a minimum of 20 feet from street lights, unless the street tree has a narrow profile in which case it can be planted a minimum of 15 feet from street lights.**

Response: The proposed street trees meet the location restrictions of this provision. Trees along Baseline Street and N 4th Street are proposed within an easement. Trees along N Adair Street are located within proposed right of way. See sheet L1.0 **Exhibit E** for street tree locations and proposed easements along all frontages.

5.11.g Root Barriers

The Trees in parkway strips shall be installed with an 18-inch deep root barrier to help prevent cracking and uplifting of adjacent sidewalks and curbs.

Response: The proposed street trees within parkway strips will be installed with 18-inch deep root barriers in an effort to mitigate displacement of adjacent sidewalks and curbs. See details on Sheet L1.0 and L1.1 of the Development Plans (**Exhibit E**).

5.11.h Planting Method

The appropriate planting methods for trees are shown in Standard Detail S-41.

Response: The proposed street trees will be planted following the appropriate method detailed in figure S-41 in the city's public works standards. See details on Sheet L1.0 and L1.1 of the Development Plans (**Exhibit E**).

5.11.i Tree Grates

Trees surrounded by pavement, such as those planted in 8-foot or wider sidewalks require tree grates. Tree grates shall be made of plastic or composite material that is able to withstand the expected traffic load of the sidewalk. Cast iron tree grates are prohibited.

Response: There are no proposed trees within the development that are surrounded by pavement. Therefore, this provision does not apply.

5.11.j Irrigation

Newly planted street trees need to be watered, especially in our region's dry summers. Watering shall be accomplished through use of a temporary irrigation system or with individual portable tree watering devices such as "gator bags." For new developments, the developer is responsible for watering the tree during the two-year warranty period.

Where a homeowner is planting a street tree or two on their property, a temporary irrigation system or gator bags are not required. The homeowner can hand water the tree(s).

Response: The landscape irrigation system will be a fully automatic underground system utilizing dripline and root zone watering. All proposed plant material will be watered and maintained for a minimum of one full growing season after the date of substantial completion.

5.11.k Groundcover

1. **In areas the City is required to maintain, grass that requires weekly mowing is not appropriate. Instead, bark dust or low maintenance groundcover is strongly preferred.**

2. **In areas where on-street parking exists, the groundcover or shrubs planted adjacent to the curb shall allow pedestrians to easily cross over the vegetation. For example, thorny bushes are inappropriate adjacent to parking spaces.**

Response: All landscape areas not planted with trees and shrubs will be planted with low maintenance ground cover plants at a density that will cover the entire area within three years from time of planting.

4.0 CONCLUSION

As evidenced through this narrative and associated documents, the applicant's design review application is consistent with the applicable local policies and regulations governing the allowance of these requests. Therefore, the applicant respectfully requests the City of Cornelius approval of this application.

Cornelius
Oregon's Family Town

Land Use Application

Community Development
Located at 1300 S. Kodiak Circle, Cornelius, Oregon 97113
www.ci.cornelius.or.us

OFFICIAL USE ONLY

Date Received:_____ Date Complete:_____ ↓ File Number ↓

Application Fee: _____ Receipt Number:_____ _____

Application Type

Type I – *administrative review without public notice*

- ☐ Design Review I
- ☐ Lot Line Adjustment
- ☐ Administrative Relief
- ☐ Land Partition—Final Plat
- ☐ Subdivision—Final Plat
- ☐ Middle Housing Land Division
- ☐ Other *please describe:*_____

Type II – *administrative review with public notice*

- ☐ Design Review II
- ■ Land Partition—Preliminary Plat
- ☐ Subdivision—Preliminary Plat
- ☐ Other *please describe:*_____

Type III – *public hearing(s) required with public notice*

- ☐ Design Review III
- ☐ Conditional Use Permit
- ☐ Planned Unit Development
- ☐ Comprehensive Plan Amendment
- ☐ Zone Map Amendment
- ☐ Zone Text Amendment
- ☐ Annexation
- ☐ ROW/Easement Vacation
- ☐ Subdivision—Preliminary Plat
- ☐ Other *please describe:*_____

Applicant Information

Name: Austin Cross Signature: *Austin Cross*

Mail Address: P.O. Box 270571, San Diego, CA 92198

Phone: 916-817-7587 Fax:_____ E-mail: across@4gdev.com

Property Owner Information

Name: HBH Equity LLC Signature: Christine Hertzell, member

Mail Address: 1049 NE 3rd Avenue, Hillsboro, OR 97124

Phone: 503-913-7377 Fax:_____ E-mail: chertzell@aol.com

Subject Site Information

Property Address: NEC of Hwy 8 & 4th Street

Map & Tax Lot Number(s): 1N333CC02400, 1N333CC02500, 1N333CC02600, 1N333CC02700, 1N333CC03000

Current Zoning: C-2 Commercial Corridor Total Size of Site: 2.28 acres

Existing Use: Residential

Proposed Use: New Quick Service Restaurant (Commercial)

Cornelius
Oregon's Family Town

Land Use Application

Community Development
Located at 1300 S. Kodiak Circle, Cornelius, Oregon 97113
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OFFICIAL USE ONLY

Date Received:_____ Date Complete:_____ ↓ File Number ↓

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Application Type

Type I – *administrative review without public notice*

- ☐ Design Review I
- ☐ Lot Line Adjustment
- ☐ Administrative Relief
- ☐ Land Partition—Final Plat
- ☐ Subdivision—Final Plat
- ☐ Middle Housing Land Division
- ☐ Other *please describe:*_____

Type II – *administrative review with public notice*

- ☐ Design Review II
- ☐ Land Partition—Preliminary Plat
- ☐ Subdivision—Preliminary Plat
- ☐ Other *please describe:*_____

Type III – *public hearing(s) required with public notice*

- ■ Design Review III
- ☐ Conditional Use Permit
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- ☐ Annexation
- ☐ ROW/Easement Vacation
- ☐ Subdivision—Preliminary Plat
- ☐ Other *please describe:*_____

Applicant Information

Name: Austin Cross Signature: *A ustin Cross*

Mail Address: P.O. Box 270571, San Diego, CA 92198

Phone: 916-817-7587 Fax:_____ E-mail: across@4gdev.com

Property Owner Information

Name: HBH Equity LLC Signature: Christine Hutzell, Member

Mail Address: 1049 NE 33rd Avenue, Hillsboro OR 97124

Phone: 503-913-7377 Fax:_____ E-mail: chutzell@aol.com

Subject Site Information

Property Address: NEC of Hwy 8 & 4th Street

Map & Tax Lot Number(s): 1N333CC02400, 1N333CC02500, 1N333CC02600, 1N333CC02700, 1N333CC03000

Current Zoning: C-2 Commercial Corridor Total Size of Site: 2.28 acres

Existing Use: Residential

Proposed Use: New Quick Service Restaurant (Commercial)

Cornelius
Oregon's Family Town

Design Review – Type II or III Submittal Checklist

Community Development
Located at 1300 S. Kodiak Circle, Cornelius, Oregon 97113
www.ci.cornelius.or.us

Written Narrative Requirements

X A. **Checklist.** Please provide one completed copy of this six-page checklist.

X B. **Description of proposal**. Please describe what changes are proposed to the site, structure, landscaping, parking, and land use. Provide findings verifying that the intended use is allowed by the City's *Development Code* (Chapter 18).

X C. **Approval criteria findings**: Please provide findings verifying that the proposal meets the Code's requirements found in *Section 18.100,* Land Use & Zoning Site Design Review, Development Requirements & Standards of the applicable zone, and the off-street parking and loading requirements of *Section 18.145.,* in addition, provide findings for any other applicable Code requirements. Specify conformance or proposed variance request from those requirements.

X D. **Technical and design standards.** Please provide findings specifically addressing each criteria found in *Section 18.100.040* of the City's *Development Code* (Chapter 18).

_____ E. **Proposed Operations:** Please provide the hours of operation, total number of employees, and maximum number of employees per shift.

_____ F. **Additional Requirements:** Please be advised that special studies, investigations and reports may be required to ensure that the proposal does not adversely affect the surrounding community, and does not create hazardous conditions for persons or improvements on the site. These studies may include investigations and reports on noise attenuation, air quality, traffic control, soil conditions, flooding of waters and storm water run-off, natural resources, tree preservation, and other concerns.

Written Narrative Requirements (cont.)

X

G. **Site Analysis Information:** See Exhibit E for Site Analysis Information

1. Existing building area: _____ sq. ft.
   Proposed building addition or subtraction: _____ sq. ft.

2. Existing building height: _____ ft.
   Proposed building height: _____ ft.

3. Existing parking area: _____ sq. ft.
   Existing number of parking spaces: _____ # sp.
   Proposed parking addition or subtraction: _____ sq. ft.
   Proposed number of parking spaces: _____ # sp.
   Proposed use: _____
   Parking requirement: _____

4. Existing landscaped area: _____ sq. ft.
   Percentage of site: _____ %
   Proposed landscape addition or subtraction: _____ sq. ft.
   Percentage of site: _____ %

_____ H. **Neighborhood Review Meeting:** information required (*Dev. Code Section 18.10.030.*). (Only required for Type III Reviews)

_____ 1. A copy of the notice sent to surrounding property owners.
_____ 2. A copy of the mailing list used to send out meeting notices.
_____ 3. An affidavit of mailing notice.
_____ 4. Representative copies of written materials and plans presented at the Neighborhood Review Meeting.
_____ 5. Notes of the meeting, including the meeting date, time, and location, the names and addresses of those who attended, and oral and written comments received.

_____ I. **Other Requirements:** Please provide documentation that the requirements from other agencies and/or jurisdictions for your proposal have been permitted OR submit your schedule for application and approval of the required permits. If applicable, include a copy of a signed Sensitive Area Pre-Screening Letter from the City Engineer. Based upon the findings of the Sensitive Area Pre-Screening Letter, a **Clean Water Services Service Provider Letter may be required.**

n/a J. **Temporary Construction Office.** Please provide information on the site plan showing the location and state the duration of the temporary construction office.

DESIGN REVIEW TYPE II & III

Plan Requirements

All plans, except architectural elevations, shall be presented at a minimum of 1" = 20' engineering scale and on a maximum sheet size of 24" x 36." Please also include one 'unbound' set that is 8 1/2" x 11" in size. Each of the following plans and drawings shall be submitted on separate sheets. Architectural elevations may be presented at an architectural scale. Please include all of the following information.

_____ A. **Existing Conditions Plan**:

✓ 1. North arrow, scale and date of plan.
✓ 2. Vicinity map.
✓ 3. The entire lot(s), including area and property lines dimensioned.
✓ 4. Points of existing access, interior streets, driveways, and parking areas.
✓ 5. Location of all existing buildings and structures.
✓ 6. Existing right-of-way and improvements.
✓ 7. Dimension from centerline to edge of existing right-of-way.
✓ 8. Existing topographical information, showing 2 ft. contours.
✓ 9. Surrounding development and conditions within 100 ft. of the property; such as zoning, land uses, buildings, driveways, and trees.
✓ 10. Location of existing public and private utilities, easements, and 100-year floodplain.
n/a 11. Sensitive areas, as defined by the Clean Water Services standards.
n/a 12. Wetland boundaries, upland wooded area boundaries, riparian area boundaries, rock out-croppings, and streams. *Wetlands must be professionally delineated*.
✓ 13. Existing trees larger than 6" in dbh (diameter at breast height), including genus, species and size. Dbh is measured at 54" above grade.

_____ B. **Dimensioned Site Plan**:

✓ 1. North arrow, scale and date of plan.
✓ 2. The entire lot(s), including area, property lines dimensioned and labeled "front," "side," and "rear."
✓ 3. Proposed points of access, interior streets, driveways, and parking areas.
✓ 4. Proposed location of buildings and structures, including refuse storage locations, pedestrian/bike paths, swimming pools, tennis courts, and tot-lots.
✓ 5. Proposed right-of-way, dedications and improvements.
✓ 6. Dimension from centerline to edge of proposed right-of-way.
✓ 7. Dimensions of all improvements, including setbacks, parking spaces, driveways, and distance between buildings.
✓ 8. Location of storm water quality/detention facilities.
n/a 9. Boundaries of development phases, if applicable.
n/a 10. Sensitive areas, as defined by the Clean Water Services standards.

n/a 11. Wetland boundaries, upland wooded area boundaries, riparian area boundaries, rock out-croppings, and streams. *Wetlands must be professionally delineated.*

_____ C. **Grading Plan**:

✓ 1. North arrow, scale and date of plan.
✓ 2. The entire lot(s).
✓ 3. Points of access, interior streets, driveways, and parking areas.
✓ 4. Location of buildings and structures, including refuse storage locations, pedestrian/bike paths, swimming pools, tennis courts, and tot-lots.
✓ 5. Proposed rights-of-way, dedications and improvements.
✓ 6. Dimension from centerline to edge of proposed right-of-way.
✓ 7. Existing and proposed topographical information, showing 2 ft. contours and appropriate spot elevations for features such as walls, retaining walls (top and bottom elevations), catch basins, stairs, sidewalks, and parking areas.
n/a 8. Location of 100-year flood plain.
✓ 9. Location of storm water quality/detention facilities.
n/a 10. Boundaries of development phases, if applicable.
n/a 11. Natural Resource Areas, Significant trees, and Historic trees, if applicable.
n/a 12. Sensitive areas, as defined by the Clean Water Services standards.
n/a 13. Wetland boundaries, upland wooded area boundaries, riparian area boundaries, rock out-croppings, and streams. *Wetlands must be professionally delineated*.
✓ 14. Existing trees larger than 6" dbh. Indicate which trees are proposed to be saved and which are proposed to be removed.

_____ D. **Utility Plan**:

✓ 1. North arrow, scale and date of plan.
✓ 2. The entire lot(s).
✓ 3. Points of access, interior streets, driveways, and parking areas.
✓ 4. Location of buildings and structures, including refuse storage locations, pedestrian/bike paths, swimming pools, tennis courts, and tot lots.
✓ 5. Proposed right-of-way, dedications and improvements.
✓ 6. Proposed topographical information, showing 2 ft. contours.
n/a 7. Location of 100-year flood plain.
✓ 8. Location of existing and proposed public and private utilities, easements, surface water drainage patterns, and storm water quality/detention facilities.
n/a 9. Boundaries of development phases, if applicable.
n/a 10. Sensitive areas, as defined by the Clean Water Services standards.
n/a 11. Wetland boundaries, upland wooded area boundaries, riparian area boundaries, rock out-croppings, and streams. *Wetlands must be professionally delineated.*

_____ E. **Landscape Plan**:

✓ 1. North arrow, scale and date of plan.
✓ 2. The entire lot(s).
✓ 3. Points of access, interior streets, driveways, and parking areas.
✓ 4. Location of buildings and structures, including refuse storage locations, pedestrian/bike paths, swimming pools, tennis courts, and tot lots.
✓ 5. Proposed right-of-way, dedications and improvements.
_____ 6. Boundaries of development phases, if applicable.
✓ 7. Sensitive areas, as defined by the Clean Water Services standards.
n/a 8. Wetland boundaries, upland wooded area boundaries, riparian area boundaries, rock out-croppings, and streams. *Wetlands must be professionally delineated*.
✓ 9. Existing trees, larger than 6" dbh, proposed to be saved. Include genus, species, and size.
✓ 10. The location and design of proposed landscaped areas, indicating all plant materials, including genus, species, common name, plant sizes, and spacing.
✓ 11. List of plant materials, including genus, species, common name, size, quantity, spacing and condition.
✓ 12. Other pertinent landscape features, including walls, retaining walls, berms, fences, and fountains.
✓ 13. A note on the plan indicating that an irrigation system will be installed to maintain the landscape materials.

_____ F. **Lighting Plan**:

✓ 1. Location of all exterior lighting, including those mounted on poles, walls, bollards and the ground.
✓ 2. Type, style, height, and the number of fixtures per light.
✓ 3. Wattage per fixture and lamp type, such as sodium, mercury, and halide.
✓ 4. 8 ½" x 11" manufacturer's illustrations and specifications (cut sheets) of all proposed lighting poles and fixtures.
✓ 5. For all exterior lighting, indicate the area and pattern of illumination measured at ½-foot candlepower.

✓ G. **Architectural Renderings and Elevations, or both:** Please provide information that identifies the general character of the buildings and structures; indicate dimensions, materials, colors, and textures proposed for any structures. This includes buildings, retaining walls, refuse storage facilities, play structures, and fences

✓ H. **Materials Board**: Please provide one 8½" x 11" or 8½" x 14" Materials Board with examples of all building materials, colors, and textures of exterior surfaces.

I have provided the items required in this six-page submittal checklist. I understand that any missing information, omissions or both may deem my project incomplete, which may lengthen the time to process the request.

Signature	Date
Print Name	Telephone Number

Cornelius
Oregon's Family Town

Land Partition - Preliminary Plat Submittal Checklist

LAND PARTITION (Preliminary Plat)
Written Narrative Requirements

__X__ A. **Checklist:** Please provide one completed and signed copy of this four page checklist.

__X__ B. **Description of proposal:** Please describe what the existing conditions are on-site and the changes proposed to the site, structure, landscaping, parking, and land use, including the number of parcels created. Provide findings verifying that the intended use is allowed by the City's *Development Code*.

__X__ C. **Approval criteria findings:** Please provide a narrative that evaluates and verifies the proposal meets the approval criteria identified below:

Section 17.05.030(C) of the Development Code

1. *The proposal conforms with the City's Comprehensive Plan.*

   Please note when making findings, the applicant shall address all applicable Comprehensive Plan policies.

2. *The proposal complies with all applicable statutory and ordinance requirements*.

   Please note when making findings, the applicant shall address all applicable Development Code requirements. Specify conformance or proposed variance request from the requirements of the Development.

3. *Adequate public facilities are available to serve the proposal; and*

4. *All proposed lots conform to the size and dimensional requirements of this ordinance; and*

5. *All proposed improvements meet City standards*.

Section 18.155 of the Development Code

1. If the subject parcel is located in the R-10 or R-7 the proposal shall meet the Solar Access Protection design standards identified in *Section 18.155* The applicant will state which option, exemption or both is chosen and describe how it complies.

__X__ D. **Additional Requirements:** Please be advised that special studies, investigations and reports may be required to ensure that the proposal does not adversely affect the surrounding community, does not create hazardous conditions for persons or improvements on the site. These studies may include investigations and reports on noise attenuation, air quality, traffic control, soil conditions, flooding of waters and storm water run-off, natural resources, tree preservation, and other concerns.

NA

E. **Fee Ownership:** If applying for a Fee Ownership Land Division please Provide findings specifically addressing each of the approval criteria found in *Section 17.05.050*, of the City's *Development Code*. The criteria below are required in addition to the evaluation of the Land Partition criteria.

1. *As a whole, the development of which the unit is a part meets ordinance criteria for lot area, lot dimensions, setbacks, parking, lot coverage, landscaping, public facilities and street frontage.*

2. *The development as a whole, the unit for which fee ownership is desired and any unit affected by the division shall meet all building, plumbing and fire code standards.*

3. *Ingress and egress is provided to all lots.*

4. *Parking is provided in accordance with ordinance standard for the individual unit either on the new lot or through easements as described in subsection 6, below. If assigned parking is provided, it shall meet ordinance standards.*

5. *Adequate public facilities are provided to the new lot.*

6. *The applicant provides deed covenants required that address: parking, maintenance of buildings and utilities, landscaping and common areas, ingress and egress. The deed covenants must be approved by the City Attorney and Planning Director.*

X

F. Sensitive Area Pre-Screening Site Assessment Letter: Please provide a copy a completed and signed Sensitive Area Pre-Screening Site Assessment Letter from the City of Cornelius City Engineer.

Plan Requirements

All plans shall be presented at a minimum scale of 1" = 20', and on a maximum sheet size of 24" x 36". Please include all of the following information on the plan.

[X] A. **Existing Conditions Plan** includes the following:

- X 1. North arrow, scale and date of plan.
- X 2. Vicinity map.
- X 3. All existing and proposed lot sizes, lot lines and dimensions.
- X 4. Points of existing access, interior streets, driveways, and parking areas.
- X 5. Location of all existing buildings and structures, including refuse storage locations and pedestrian/bike paths.
- X 6. Existing right-of-way and improvements, including sidewalk dimensions.
- X 7. Dimension from right-of-way centerline to edge of existing property line and to required right-of-way dedication.
- X 8. Dimensions of all improvements, including setbacks.
- X 9. Location of existing public and private utilities, and 100-year floodplain.
- X 10. Topographical information, (2 ft. contour lines) of existing grades.

[X] B. **Proposed Preliminary Plat** includes the following:

- X 1. Location, widths and names of all existing, proposed streets and public ways within or adjacent to the plat. Illustrate easements for utilities, other encumbrances and railroad right-of-ways. New streets shall be designated with proposed street names.
- X 2. Dimension from right-of-way centerline to edge of existing property line and to required right-of-way dedication.
- X 3. Location of existing and proposed easements.
- X 4. Location of at least one temporary bench mark within the plat boundaries.
- X 5. Square footage of all proposed lots.
- X 6. The total gross acreage of the partition plat.
- X 7. Identify and label on the plat conformance with the Solar Ordinance requirements.

[X] C. **Preliminary Plat Reduction** includes the following:

- X 1. Provide one proposed preliminary plat reduced to 8.5" x 11".

[X] D. **Proposed Improvement Plan** includes the following:

- X 1. North arrow, scale and date of plan.
- X 2. All proposed lot sizes, lot lines and dimensions.
- X 3. Dimension from right-of-way centerline to edge of existing and proposed property line and to required right-of-way dedication.
- X 4. Existing and proposed right-of-way and improvements, including sidewalk dimensions.
- X 5. Topographical information, (2 ft. contour lines) of existing and proposed grades.
- X 6. Location of proposed public and private utilities, proposed easements, and 100-year floodplain.

__X__ 7. Plans and profiles of proposed sanitary and storm sewers, showing that gravity service is feasible for all lots.

__X__ 8. Cross-section of all street and bike path improvements.

[X] E. **Landscape Plan**:

__X__ 1. Submit proposed landscaping of water quality, water quantity, wetland mitigation, common space and other non-buildable tracts. Plantings of water quality or quantity facilities shall be designed in accord with Clean Water Services (CWS) standard plant list.

I have provided the items required in this four page submittal checklist. I understand that any missing information, omissions or both may deem my project incomplete, which may lengthen the time to process the request.

Mike Towle
Print name

503-679-1769
Telephone Number /FAX Number

Signature

10/3/24
Date

Cornelius
Oregon's Family Town

PRE-APPLICATION CONFERENCE
PAC-03-24

Tuesday, March 12, 2024
Community Development Department
1300 S Kodiak Circle
Cornelius, OR 97113

Land Use Notes

Applicant: Austin Cross
4G Development
Email: across@4Gdev.com

Site of Interest: 25 N 4th Ave; West of 4th Avenue between Baseline and Adair

Map and Tax lot: 1N333CC02400, 2500, 2600, 2700, 3000

Applicants in Attendance: Austin Cross, Kevin Watson, Matthew Robison, Mike Towle.

Staff in Attendance: Barbara Fryer, Community Development Director; Yvette Hamilton, Building Official; Terry Keyes, City Engineer; Mark Crowell, Public Works Director; Kevin Oppenlander Project Manager; Susan Rush, Permit Technician.

Other Agency Staff in Attendance: Marah Danielson, ODOT Region 1 Development Review Manager; John Russell, ODOT Traffic Analysis Engineer, Tony Rikli, ODOT Access Management Engineer.

Address(s) of site under Consideration: The subject site consists of five tax lots, totaling approximately 2.28 acres.

- Tax Lot 1N333CC02400 is addressed as 47 N 4th Avenue and is approximately .87 acres
- Tax Lot 1N333CC02500 is undeveloped and is approximately .17 acres
- Tax Lot 1N333CC02600 is addressed as 316 Baseline Street and is approximately .65 acres It is developed with an older legal nonconforming single-family dwelling.
- Tax Lot 1N333CC02700 is addressed as 300 Baseline Street and is approximately .03 acres.
- Tax Lot 1N333CC03000 is undeveloped and is approximately .23 acres.

The properties are located within the Highway Commercial, C-2 zoning district of the City of Cornelius.

Proposal: The applicant is proposing to redevelop the site with one fast food drive through restaurant (as proposed within the documents of the pre-application conference request).

Land Use Requirements:
This land use summary is comprised of the guidance provided at the March 12, 2024 pre-application conference. These applications are:

(1) Type III Site Design Review. This is a technical review of the proposed on-site improvements by the Planning Commission. Fee: $3,569.00. Processing time: generally, 8 to 10 weeks following city determination that the application is complete to Planning Commission Decision.
(2) Preliminary Land Partition to consolidate the five tax lots into one new legal described lot will be necessary, via a 'One-lot land partition'. This application may be made prior to or after review of the Type III Site Design Review. Please note, prior to issuance of development permits, the lots will need to be legally re-described as one lot through the partition and final plat processes. Fees: Preliminary Partition is $1516.00 and then the Final Plat is $484.00. Processing time: generally, 5 to 6 weeks upon a city determination that the application is complete to a final decision.

Please note Application fees typically increase on July 1 every year.

You may combine the two applications and have them reviewed by the Planning Commission or you may apply for them separately. However, the mylar for the land partition must be recorded prior to issuance of Building Permits.

All applications that are reviewed at a public hearing require a neighborhood meeting to be held by the applicant. Notices for the neighborhood meeting must be sent out no less than 20 days prior to the scheduled neighborhood meeting. Notice to property owners within 250 feet of the subject site is required. A title company can assist you with obtaining a mailing list for your notice to be sent out; a copy of the notice shall also be sent to the Community Development Department staff. Information regarding the noticing requirements is attached. Please note that neighborhood meetings are only valid for a period of 180 days. The meeting must be in an ADA assessable location within Cornelius. Your application is incomplete without a notarized affidavit of the mailing list and neighborhood meeting announcement, a list of attendees, and minutes from your neighborhood meeting.

Application Review: Staff will review an application for completeness within thirty (30) days of receipt. The applicant will be notified in writing on the status of completeness. An application must be deemed complete by the 10th of the month in order to be scheduled

for the following month's Planning Commission meeting (e.g., May 10th for a June hearing). If the application is deemed complete the City will begin to process the application, including the required public notice. Staff will review the application materials and prepare a staff report with a recommendation to the Planning Commission. The staff report will be complete and available one week prior to the Planning Commission hearing. The Planning Commission meets the fourth Tuesday of each month.

Staff recommends that an application should be submitted for completeness review a minimum of 15 to 20 days prior to the 10th of the target month. This will allow staff adequate time to review your application and, if needed, it provides you time to respond to any staff requests for additional application materials.

Decision/Appeal: Once a decision is made, a Notice of Decision will be sent to the applicant. The Notice of Decision will identify the appeal period and options for appeal. Once the appeal period is over, you may proceed with complying with the conditions of approval.

Please note that the City of Cornelius is currently contracting building services, review, and inspections with the City of Forest Grove Building Division. The land use application(s) described above must be completed and approved prior to submittal of any applications to the Forest Grove Building Division that may be required.

Land Use Project Specific Information: Based on the information provided during the pre-application conference, here are comments/concerns that were generally discussed. There may be other unforeseen issues/concerns that cannot be addressed until an application packet is submitted to the city for review and consideration.

Please note: The pre-application conference covers the proposed drive-through fast-food restaurant.

- Drive-through uses require identification of adequate stacking on the property.
- Development and use of the site will need to comply with Title 18 of the City of Cornelius Development Code. This includes, but is not limited to, demonstrating compliance to Chapters 18.45 Highway Commercial, C-2; 18.100 Site Design Review, 18.105 Conditional Use Permit; 18.143 Transportation Facilities, 18.145 Off-Street Parking and Loading; 18.150 Special Use Regulations; and 18.155 Solar Access for New Development.
- The site abuts Baseline Street and N Adair Street (Oregon Department of Transportation, ODOT facilities). N 4th Avenue is a City street. Access on Baseline Street and/or N Adair Street should be as far west as possible, as directed and ultimately approved by ODOT. An ODOT letter of response for the proposed development shall be included in the land use application submittal.
- All utilities shall be located underground.

- It is unknown if ODOT will require additional rights-of-way along Baseline Street or N Adair Street. At the Pre-Application meeting, ODOT stated that they will require a Traffic Impact Assessment to determine if a dedicated left turn lane is required on Adair and Baseline. The City Engineer will determine if additional right-of-way along N 4th Avenue is needed.
- All signage shall comply with the Sign Code. It is important to note that the site does has an existing billboard. The billboard is considered legal non-conforming and it currently does not comply with current Sign Code requirements. Redevelopment requires the site to conform to the current code, which requires the billboard removal.
- A screened trash enclosure will be required. Please provide a detail of the screened trash enclosure within your application packet. The trash enclosure will need to accommodate recycling, food waste and garbage bins. You will need to submit a letter from the garbage hauler that they have reviewed your site plan and that the size of the trash enclosure is sufficient for the waste anticipated for your site and that the location is sufficient for efficient hauler maneuvering.
- On-site parking, bicycle parking, parking lot area and vehicle stacking areas are found within CMC 18.145. Please note the required vehicle reservoir requirements for drive-in restaurants of 10 spaces/service window. You will need to comply with OAR 660-012-405, including the designated employee parking for parking areas with more than 50 spaces ((1)(a)), and the parking lot requirements for more than one-half acre of new off-street parking ((4) (a) through (e)). Please provide a detail of the required bicycle parking rack(s).
- A Service Provider Letter from Clean Water Services (CWS) is required as part of all applications.
- All on-site stormwater facilities must be identified and built to CWS standards. A stormwater report is necessary, which will be reviewed by the City Engineer. The stormwater report and proposed stormwater facilities must be included within your land use application packet.
- Proposed on-site lighting shall not shine or glare onto abutting properties or within the abutting ROW's. A photometric study and sheet with lighting details is required.
- A detail demonstrating pedestrian connectivity from Baseline Street, N Adair Street and N 4th Avenue to the new building is required.
- All landscaping shall be irrigated. Provide a detailed landscaping plan with irrigation, types of proposed vegetation, trees, materials and their respective location is required.
- All vehicle maneuvering areas are to be of an approved impervious (concrete or asphalt) surface.
- A materials/color board of the proposed new building is required in the application packet.
- Any water meters will need to be within the ROW, not on private property.
- On the submitted site plan please demonstrate compliance with Chapter 18.150.070 (Clear Vision Areas) at the driveways.

Questions and answers via email

Building related questions
(Red - response by Yvette Hamilton, Building Official)
(Blue – response from Planning Department)

- What is required to be submitted with building construction documents?
  Site plan? **yes**
  Survey(s)? **no**
  Landscape plan? **no (may be required for planning approval)**
  Irrigation plan **no**
  Elevations? **yes**
  Energy calculations? **yes**
  Structural/wind load calculations? **yes**
  Other? **Please provide separate plans for ARCHITECTURAL, STRUCTURAL, PLUMBING, MECHANICAL. If using manufactured roof trusses, please provide stamped engineered details and layout with the structural calculations. You may defer the mechanical plans and applications.**
- You mentioned 2-3 weeks for first round review, how about subsequent reviews? **same**
- Any other permits through City of Forest Grove besides Building, Mechanical, Plumbing, Grading? Is a demo permit required? **Yes, a demo permit is required. When we do the inspection, we will want to see that water and sewer are capped.**
- Are submittals digital or physical? **Everything needs to be submitted electronically, but we do require one set of engineering calculations and structural drawings (including trusses) to be paper copies for our consulting engineer.**
- Can building permit plans be submitted without a contractor being named? **Yes**
- Are deferred submittals allowed? **Yes**
- How long are permits valid? What is the process to re-permit (including fees and timing)? **As long as you are having regular inspections, the permit will stay active. If you have not had any inspections for 180 days, the permit expires.**
- Is a pre-construction meeting required prior to commencement of construction and if so, what is the process to schedule the meeting? **No, not required, but you are more than welcome to request a pre-con meeting with building and planning if you wish.**
- Is there a pre-construction checklist of items/tasks required in order to start construction **No, not from the building department. There will be specific conditions of approval from the Type III Site Design Review (DR) application that will need to be addressed prior to the start of construction.**
- Will any bond be required? **Yes, bonds will be required. Please contact Susan Rush, Permit Specialist at (503) 357-3011 to discuss the applicable bonds and bonding process.**
- Grease Interceptor sizing formula: **Please discuss with your plumber**
- Is Recycling Program required for construction? **Businesses are required to comply with CMC 8.05.150 Business Recycling.**
- Is Recycling required for on-going restaurant? **Businesses are required to comply with CMC 5.60 Food Waste Requirements.**
- Is a job trailer allowed on site? **Yes, through the Type III Site Desing Review, on a site plan, show the proposed location of the job trailer.**
- What design elements are required for an on-site trailer? **A manufactured structure set up permit is required for a job shack.**

- Is a permit required to have an on-site trailer? **A manufactured structure set up permit is required for a job shack.**
- Are there accessibility requirements that would supersede the Federal and State accessibility requirements? **Please contact the City of Forest Grove Building Department**
- Are separate employee restrooms required? **no**
- **These 3 questions are something you'd need to discuss with your plumber.**
    - Are there any restrictions with PVC piping?
      Please contact the City of Forest Grove Building Department
    - For walk-in cooler/freezer, is the condensation line allowed to be connected to the sanitary sewer line?
      Please contact the City of Forest Grove Building Department
    - For air conditioning units, is the condensation line allowed to be connected to the sanitary sewer line?
- Racking Permit Required? **Are you talking about storage racks? Yes.**
- If so, what is the threshold height or other criterion for requiring a Rack Permit? What is required for Rack permit submittal?

Planning Questions

- What is the process for assigning an address to the site? **Addresses are assigned with the submittal of a Building Permit by the Senior Planner, in coordination with the Fire Department. If possible, an existing address will be used.**
- When in the process is an address assigned? **See response above**
- Is a flag pole permitted and what height is allowed? **Yes, the location and details of the flag pole will need to be provide within the Type III DR application. Per CMC 18.150.050 flagpoles are not subject to the height limitation of the zone. Please note, if a corporate flag is flown, it is then considered signage and the structure and sign are subject to CMC 18.175 of the Sign Code.**

Sign Permit Questions:

- How many sets of plans are required? **For a sign permit, one pdf, or set of the plans with the Sign Permit application is necessary.**
    - **Signage is not approved with the Type III DR application that the Planning Commission will review. Attached is a Sign Permit application for your review and use. Below is a link to the sign code where you can review the code related to signs. https://www.codepublishing.com/OR/Cornelius/#!/Cornelius18/Cornelius18175.html#18.175**
    - **An application with the supporting documents may be submitted back electronically, as a pdf, or as hard copies. Once a complete Signe Permit application has been received, a staff report will be prepared and the application fee will be calculated. The current sign permit application fee is $100.00 + $2.00/square foot.**
    - **Once a sign permit application has been reviewed, approved and the fee collected, a land use compliance form will be issued. (Please note the City of Cornelius can only accept a check of cash method of payment). The City of Cornelius currently contract building services through the City of Forest Grove Building Division. Building Permits for signage are reviewed and approved by Forest Grove. Please contact the City of Forest Grove Building Division to discuss plan submittal requirements for signage.**

- **Electrical Permits are reviewed and approved through Washington County.**
- Are signed and sealed wind load calculations required? **Please contact the City of Forest Grove Building Division.**
- What is the time frame for review? **Once a complete sign permit application has been received, the City of Cornelius will process it within 10-working days. Please contact the City of Forest Grove Building Division to inquire about their review timeframe.**
- Can plans be submitted for review without a contractor? **Please see the sign permit application and required information needed for submittal.**
- What fee, if any, is required for submittal? **Please see earlier response.**
- Can signs permits be submitted on one sign permit application or does each sign require a separate application? **All proposed wall signage may be bundle into one Sign Permit application. All proposed freestanding signs may be bundled into one Sign Permit application. Please note, the drive-thru menu boards and on-site directional signage are not reviewed through CMC 18.175. Please include details and locations of the site plan of the Type III DR. All proposed signage must comply with CMC 18.150.070 Clear vision zones.**
- Can the variance package be submitted via overnight delivery? **Application packages may be submitted to the City of Cornelius Community Development Department, 1300 S Kodiak Circle, Cornelius, OR 97113.**
- Can a sign variance request be concurrent with other reviews? **Please review CMC 18.115 Variances and CMC 18.175 Signs. Concurrent review by the Planning Commission may be possible. Please note, based upon the CMC, a request and justification for a sign variance may be challenging.**

Engineering: Terry Keyes, P.E., City Engineer has prepared written comments concerning development of the site. Attached are his comments dated March 12, 2024.

Fire: Chad Toomey, Deputy Fire Marshal, noted that access and water supply were the key components for the Fire Department. He noted that a turning radius graphic is required to demonstrate fire apparatus can maneuver into and within the site. Hydrant and FDC location are required on the plans. A Knox Box and addressing standards will be required.

Building: Building Official Yvette Hamilton stated that fire sprinklers and life safety compliance will be required. Structural reviews are conducted by a third party and are typically 2-3 weeks out. There is also a separate fire, life safety review. A Geotech report will be necessary with the development permit submittal. The project will need to comply with all applicable ADA requirements, as well as all applicable State Building Code requirements. Building Permit submittals (except electrical which is issued through Washington County) are applied for and reviewed through the City of Forest Grove Building Division. The Forest Grove Building Department Main Phone Line is 503-992-3229. Building Official Yvette Hamilton can be reached by email at yhamilton@forestgrove-or.gov

A Commercial & Industrial Fee Estimate Work Sheet is also attached for your use to estimate System Development Charge (SDC) fees. If you have questions about SDC fees, please contact Susan Rush, Permit Technician at (503) 357-3011.

Oregon Department of Transportation: Baseline Street and N Adair Street are ODOT facilities, which is commonly known as State Highway 8. Access and ROW development permits are necessary from ODOT for establishing/improving access and ROW improvements along Baseline Street and N Adair Street. When we receive ODOT's pre-application conference comment letter, we will forward it to you. You will need to secure a letter from ODOT to submit with your application package.

Other: There is a Washington County Transportation Development Tax (TDT). The TDT is a County-wide voter approved tax that the City administers within its limits. When development within the County occurs, the TDT must be assessed. To learn more about the TDT, we recommend that you review the Washington County TDT information page at:

https://www.co.washington.or.us/LUT/Divisions/LongRangePlanning/PlanningPrograms/TransportationPlanning/transportation-development-tax.cfm

The TDT is due at the time of issuance of a Building Permit. It may be deferred until issuance of an Occupancy Permit or it may be paid in installment payments with City approval. Historically, each July 1, the TDT has increased between 2% to 4%.

Thank you very much for taking the time to meet with us. If you have any further questions or if you need additional assistance with your application submittal process, please contact us at (503) 357-3011. We look forward to working with you to make your future development within the City of Cornelius a success.

Sincerely,



Barbara Fryer, AICP
Director,
Community Development Department

Memo

Subject: Preliminary Engineering Comments Chick-fil-A at 4th-Baseline-Adair in Cornelius

Date: March 12, 2024

By: Terry, Keyes, P.E., City Engineer

These comments are based on existing conditions on the site.

The comments are preliminary and designed to help in creating a final design that can be considered as part of the land use process. While the comments should not be interpreted as the final engineering comments on the development, these comments attempt to cover all major public infrastructure, erosion control, and stormwater runoff requirements related to development of this site.

General

The site consists of multiple parcels totaling 2.3 acres on the west side of 4th Avenue between Adair and Baseline.

All plans for public improvements must be designed by a registered professional engineer. Bonding for public improvements is typically required to ensure the improvements are completed in a satisfactory manner. Improvement plans for Baseline and Adair must be approved by both the City and Oregon Department of Transportation (ODOT). ODOT requires its own permits for work in their right-of-way. The timelines for ODOT review and permitting is typically longer than the city's timelines.

Street

Baseline

The frontage along Baseline is unimproved with a narrow shoulder adjacent to a road-side ditch. Overhead telecommunication lines are mounted on poles along the north side of Baseline.

Frontage improvements required by the City include:

- **Concrete curb and gutter**
- **6-foot parkway strip with street trees meeting the City's Public Works Standards**
- **6-foot concrete sidewalk**
- **Cobra-head street lights on their own poles**
- **Undergrounding all overhead lines**
- **Driveways entering Baseline shall meet the Cornelius Standard Detail for a *Commercial Driveway with a Parkway Strip (Detail S-22)* or ODOT standards**

Since Baseline is State highway, ODOT may have additional requirements for frontage improvements. If the City and ODOT requirements conflict, typically the more stringent requirement prevails.

As an ODOT road, ODOT controls access to Baseline. **The applicant will need to gain permission from ODOT for the proposed access onto Baseline. Also, permits from ODOT are required for all work in their right-of-way.**

4th Avenue

The frontage along 4th is improved with a concrete curb and gutter and a concrete curb-tight sidewalk. Two existing driveways access 4th from the site.

Cobra-head street lights are mounted on their own poles on 4th. No overhead power lines exist on the west side of the 4th.

Since frontage improvements on 4th are complete, the applicant only needs to replace the existing driveway drops with sidewalks and install street trees along 4th. Street trees can be placed on the west side of the existing sidewalk.

Adair

The frontage along Adair is unimproved with a shoulder adjacent to a road-side ditch. No overhead utility lines exist on Adair. Street lights exist on the north side of Adair.

Frontage improvements required by the City include:

- **Concrete curb and gutter**
- **6-foot parkway strip with street trees meeting the City's Public Works Standards**
- **6-foot concrete sidewalk**
- **Driveways entering Baseline shall meet the Cornelius Standard Detail for a *Commercial Driveway with a Parkway Strip (Detail S-22)* or ODOT standards**

Since Adair is State highway, ODOT may have additional requirements for frontage improvements. If the City and ODOT requirements conflict, typically the more stringent requirement prevails.

As an ODOT road, ODOT controls access to Adair. **The applicant will need to gain permission from ODOT for the proposed access onto Adair. Also, permits from ODOT are required for all work in their right-of-way.**

Traffic Study

The City will not require a traffic study for this development because the traffic volumes anticipated for this type of development are highly unlikely to cause any needs for mitigation measures.

Water

An 8-inch ductile iron water main exists on 4th Avenue adjacent to the site. This main meets current standards. A 12" ductile iron water main exists on Adair which meets current standards.

A 4-inch unlined cast iron water main exists along the Baseline frontage that does not meet standards.

The applicant is required to replace the substandard water main along the Baseline frontage with an 8" C900 pipe.

A fire hydrant exists on the NW corner of 4th and Baseline. Hydrants also exist on the north side of Adair opposite the site. The applicant Is required to install at least one new hydrant in association with the new water main on Baseline near the western edge of their project. The fire department may require additional hydrants for the project.

Sanitary Sewer

Public sanitary sewers exist along the Baseline frontage and on the east side of 4th. Both these sewers have capacity for the project. No public sanitary sewer improvements are required.

Stormwater

Conveyance

A public storm sewer exists on the east side of 4th Avenue. As part of the frontage improvement on Adair and Baseline, the applicant needs to install catch basins and new storm sewers along the frontage.

Treatment, Detention, and LIDA

Stormwater runoff from all new development in urban Washington County must be treated and detained in accordance with Clean Water Services (CWS) Standards. The CWS requirements consist of three parts.

1) *Treatment* – All runoff from new impervious surfaces must be treated before release into the public storm system. Treatment for commercial sites like this typically entails use of biofiltration swales, rain gardens, or stormwater filters

2) *Hydromodification or Detention* – This requirement is based on a series of factors These factors and their ratings for this site are:

   Risk – low
   Development Class – developed area
   Project Size – large (over 80,000 sq.ft.)

   These criteria place the project in CWS's *Category 2*. Category 2 projects require significant detention as spelled out in the CWS Design and Construction Standards. Detention is typically provided by underground pipes or ponds.

3) *Low Impact Development Approach (LIDA)* – Projects must also incorporate some type of LIDA or green approach to stormwater control. Surface stormwater

facilities such as swales and detention ponds meet the LIDA requirement. Other approaches that meet LIDA include: pervious pavement and green roofs.

Therefore, the project will need to meet the CWS requirements for treatment, hydromodification, and LIDA.

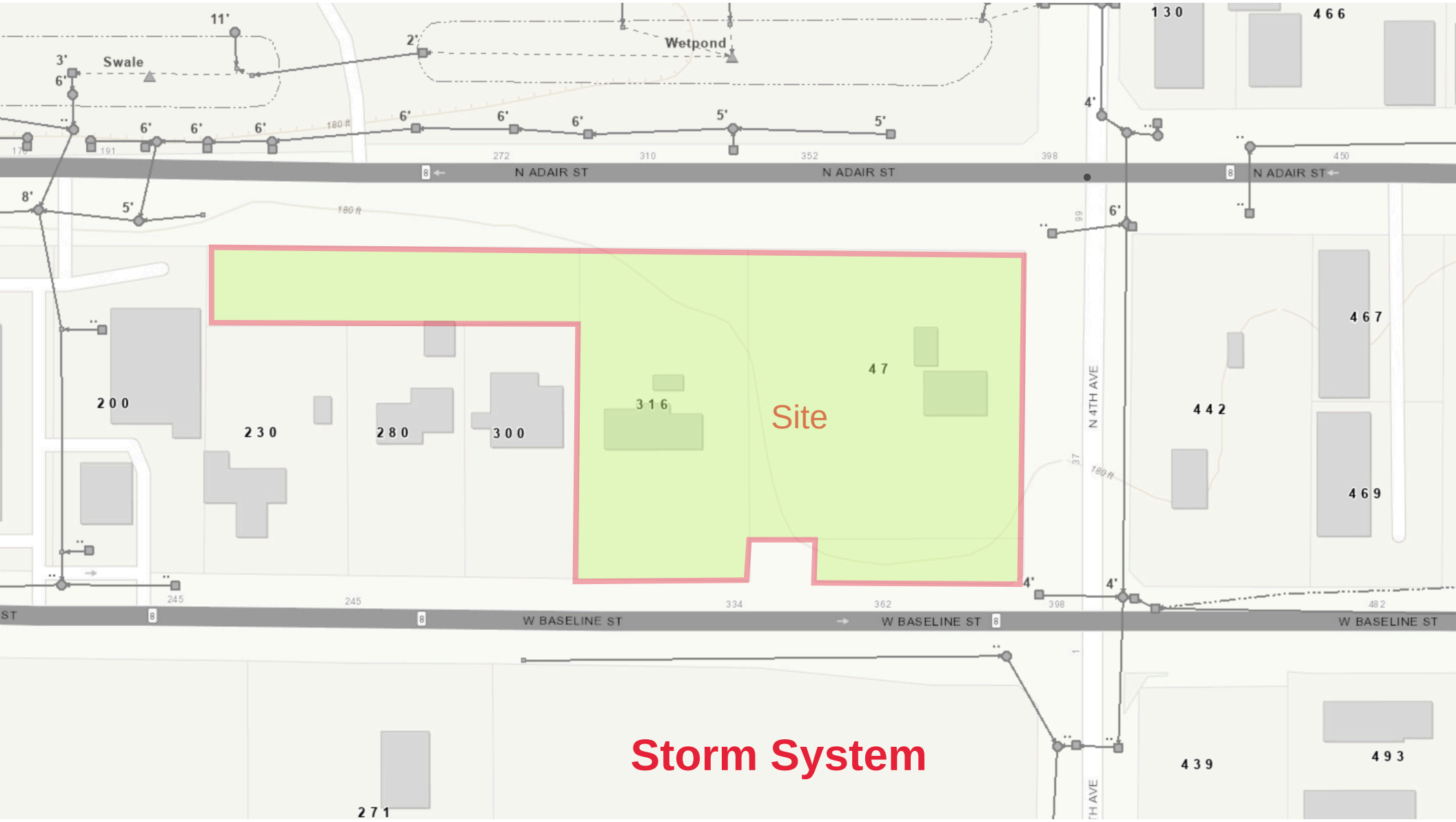
Service Provider Letter

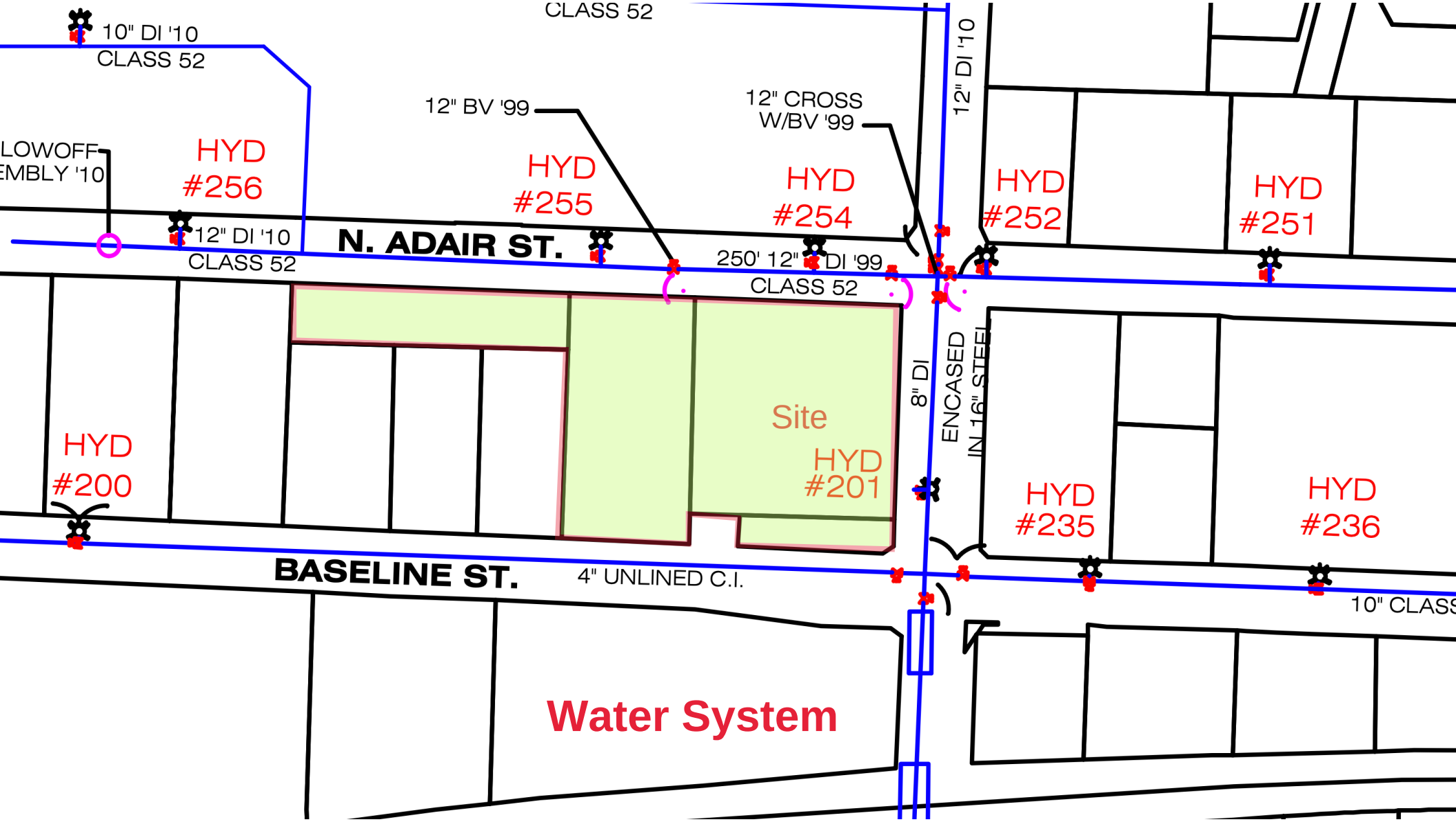
The applicant must obtain a *Service Provide Letter* (SPL). The SPL will determine if wetlands exist on or adjacent to the site and, if they do, will specify the vegetated corridor or buffer requirements for the site. The City or Clean Water Services can provide this SPL.

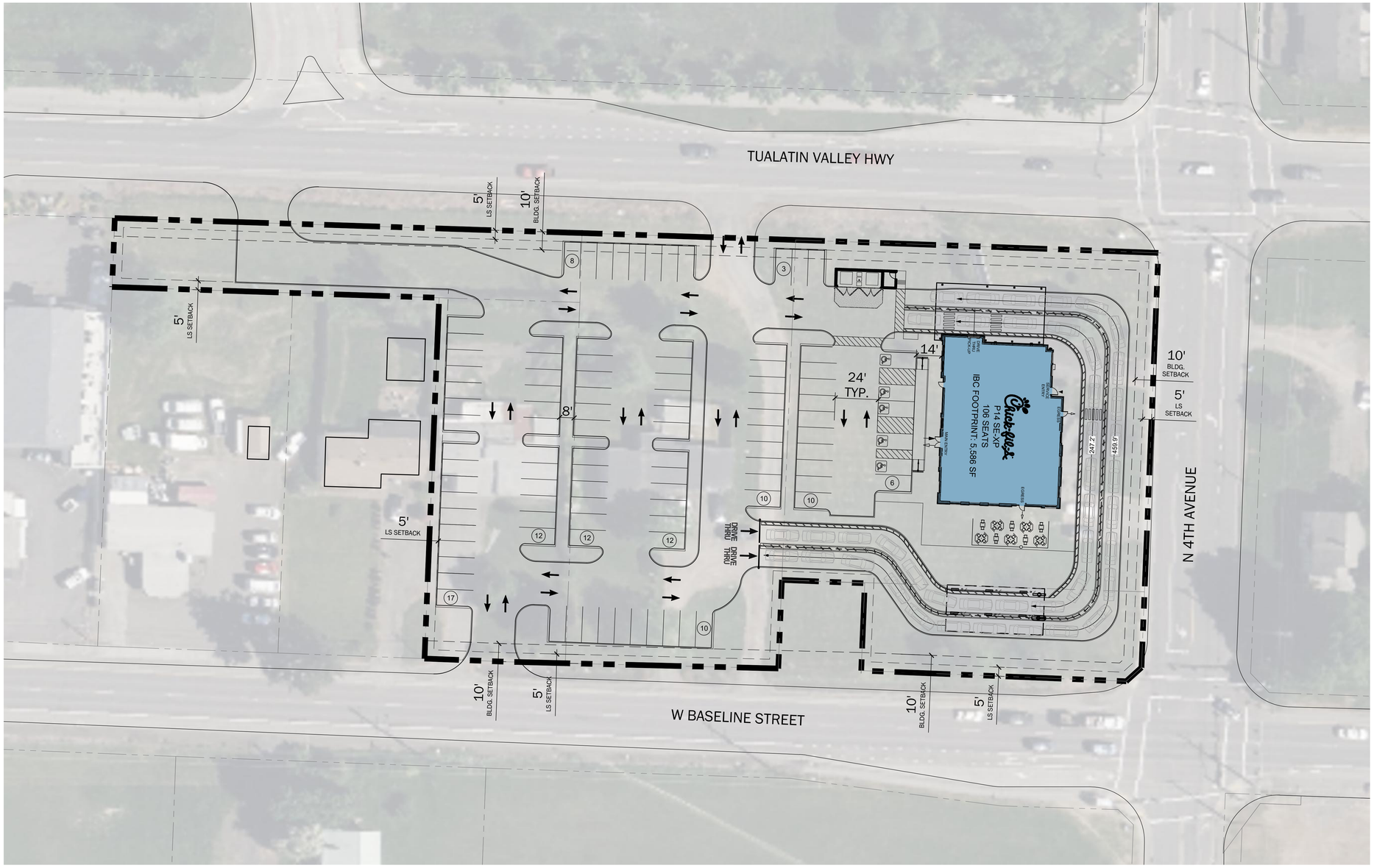
Erosion Control

An erosion control plan is required for this project. Since 1 acre or more of land will be disturbed, the erosion control plan will need to meet the requirements for a 1200-CN permit and will go through City, CWS, and State Department of Environmental Quality (DEQ) review.


N ADAIR ST
N ADAIR ST
N ADAIR ST
W BASELINE ST
W BASELINE ST
W BASELINE ST
N 4TH AVE
8" PLP
10" PLP
10" CIP
6" PVC
6"
8"
9'
180 ft
Site
47
316
200
230
280
300
130
466
467
442
469
439
493
271
Sanitary Sewers


Swale
Wetpond
N ADAIR ST
N ADAIR ST
N ADAIR ST
W BASELINE ST
W BASELINE ST
W BASELINE ST
N 4TH AVE
Site
47
316
200
230
280
300
130
466
467
442
469
439
493
271
Storm System


CLASS 52
10" DI '10
CLASS 52
12" BV '99
12" CROSS
W/BV '99
12" DI '10
LOWOFF
EMBLY '10
HYD
#256
HYD
#255
HYD
#254
HYD
#252
HYD
#251
12" DI '10
CLASS 52
N. ADAIR ST.
250' 12" DI '99
CLASS 52
8" DI
ENCASED
IN 16" STEEL
Site
HYD
#201
HYD
#200
HYD
#235
HYD
#236
BASELINE ST.
4" UNLINED C.I.
10" CLASS
Water System



DEVELOPMENT STANDARDS

Zoning

Jurisdiction		Cornelius, OR
Zoning Designation		C-2 [1]
Max F.A.R		TBD
Max Height		35 FT
Building Setbacks		
	Front	10 FT [2]
	Interior Side	0 FT [3]
	Street Side	10 FT [2]
	Rear	0 FT [3]
Landscape Setbacks		[6]
	Front	5 FT
	Side	5 FT [4]
	Rear	5 FT [4]
Parking Standards		
	Min Stall Size	9x20
	Compact Stalls	8x16
	Compact %	25% [8]
	Overhang	TBD [9]
	Drive Aisle	24 FT [5]
	Landscape Islands	6 FT
Required Parking		
Easting & Drinking Establishments		
	Fast-Food (Min):	9.9/1000 SF [7]
	Fast-Food (Max):	12.4/1000 SF [7]

PROJECT DATA

Site Summary

		APN(s): ##
Gross Site Area	101,361 SF	2.33 AC
Total Building Area(s)	Gross Floor Area	5,663 SF
	Footprint	5,663 SF
Coverage	Gross	6%
FAR	Gross	0.06

Building 1

Building Area(s)	Footprint	5,663 SF
Cars Required (Min)		56 Stalls
Cars Required (Max)		70 Stalls
Cars Provided		100 Stalls
	Req. Accessible	4 Stalls
DT Car Stack		38 Cars
OP Canopy		12th Car at Inner Lane

Notes

1. C-2 (Highway Commercial Zone): Indoor amusement or entertainment and restaurants, including fast food with drive-up window, are permitted.

2. For all properties abutting the south side of Baseline Road, there shall be a front yard setback equal to five percent of the average lot depth, but not less than four feet.

3. 5 ft when abutting a residential use or zone. When a side/rear yard abuts a public street the setback shall be the same as the front yard.

4. Where the boundary of a parking lot in a nonresidential zone adjoins a residential district, a 10-foot landscaped strip shall be provided along the entire length abutting the residential zone.

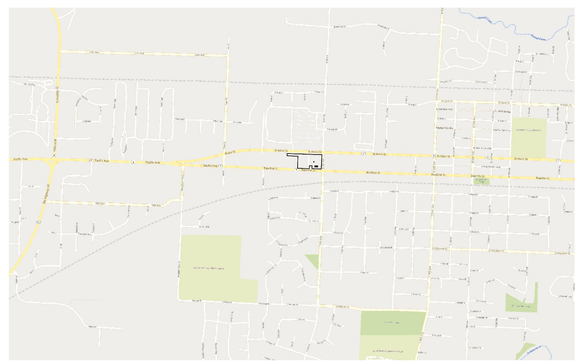
5. No entrance or exit shall be located closer than 100 feet to any intersection of a public street, unless there is no reasonable alternative. All driveways for new construction shall have minimum pavement width of 12 feet and shall not be more than 35 feet in width at the curb, unless specifically approved by the review body to meet unusual requirements of a particular use. A clear vision zone shall be maintained on the corners of all property adjacent to the intersection of two streets, a street and a railroad, or a driveway providing vehicular access to a public street; extending 15 feet along the leg of each intersection. No fence, berm, wall, hedge or other planting or structure shall be placed within the clear vision zone that would impede visibility between a height of 30 inches and 10 feet as measured from the top of curb, or in the absence of a curb, from the established street center line grades. If the relation of the surface of the lot to the streets is such that visibility is already obscured, nothing shall be done to increase the impediment to visibility within the vertical and horizontal limits set forth above. Poles, tree trunks, and similar objects less than 12 inches in width may be allowed in the clear vision zone if they meet the vertical requirements noted above.

6. There shall be a five-foot landscaped buffer at the perimeter of all parking lot areas. Parking lots shall be designed and landscaped so as to break up large paved areas with landscaped islands, at a minimum of every 10 spaces.

7. Maximum parking standards for Zone A: Fast-Food: 12.4/1,000 SF, Other: 19.1/1,000 SF

8. 25% of available parking spaces.

9. The facilities and design review committee or the planning commission may approve parking spaces without wheel stops, provided the abutting sidewalk is increased by 3 ft in width and/or the appropriate landscaping is planted where the bumper would overhang.



1" = 25'

0 12.5 25 50 125

NORTH

This conceptual design is based upon a preliminary review of entitlement requirements and on unverified and possibly incomplete site and/or building information, and is intended merely to assist in exploring how the project might be developed.

Boundary Source:
REGRID PARCEL DATA
www.regrid.com

Stormwater Management Design:
ASSUMED UNDERGROUND SYSTEM

SCHEME: PSP04

Conceptual Site Plan

W Baseline St & N 4th Avenue

Cornelius, OR 97113

WARE MALCOMB

LAX24-0014-00
2024.04.01

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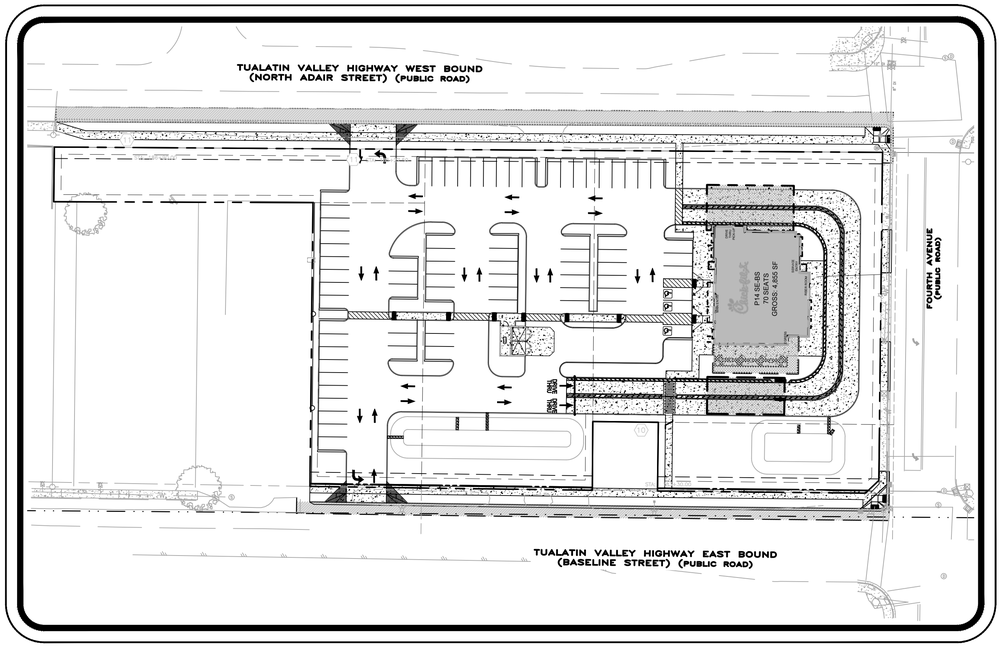
CHICK-FIL-A CORNELIUS AT HW 8 & 4TH AVE

HIIGHWAY 8 & N 4TH AVE
CORNELIUS, OR 97113
LAND USE DOCUMENTS



VICINITY MAP

SCALE: NTS



SITE MAP

SCALE: 1" = 50'

SITE STATISTICS

ADDRESS:
25 N 4TH AVE; WEST OF 4TH AVE BETWEEN BASELINE ST AND ADAIR ST
CORNELIUS, OREGON 97060

PRE-DEVELOPMENT:		
SITE IMPERVIOUS AREA:	20,824 SF	0.48 AC
SITE PERVIOUS AREA:	80,537 SF	1.85 AC
POST DEVELOPMENT:		
SITE IMPERVIOUS AREA:	63,066 SF	1.45 AC
SITE PERVIOUS AREA:	38,295 SF	0.88 AC

SHEET INDEX

C0.0 - COVER SHEET
C1.0 - EXISTING CONDITIONS & DEMO PLAN
C1.1 - EXISTING LOT PLAN
C1.2 - PRELIMINARY PLAT
C2.0 - SITE PLAN
C2.1 - PUBLIC IMPROVEMENT PLAN
C3.0 - GRADING PLAN
C4.0 - STORM PLAN
C5.0 - UTILITY PLAN
L1.0 - PLANTING PLAN
L1.1 - PLANTING LEGENDS & NOTES
A-302 - EXTERIOR ELEVATIONS - COLOR
ES1.0 - ELECTRICAL SITE LIGHTING PLAN
EP1.0 - ELECTRICAL SITE PHOTOMETRIC PLAN
EP1.1 - SITE LIGHTING CUTSHEET
EP1.2 - SITE LIGHTING CUTSHEET
E5.0 - SINGLE LINE DIAGRAM

SITE INFORMATION

THE SITE IS LOCATED IN THE SW QUARTER OF SECTION 33, TOWNSHIP 1 NORTH, RANGE 3 WEST, WILLAMETTE MERIDIAN, IN THE CITY OF CORNELIUS, WASHINGTON COUNTY, OREGON, AND IS DESIGNATED WITH TAX LOTS #1N333CC02400, #1N333CC02500, #1N333CC02600, #1N333CC02700, #1N333CC03000. THE SITES SOUTHEAST CORNER BORDERS THE INTERSECTION OF BASELINE ST AND N 4TH AVENUE, WHILE THE SITES NORTHEAST CORNER BORDERS THE INTERSECTION OF N ADAIR ST AND N 4TH AVE..

A PROPOSED RESTAURANT WITH A CONCRETE DRIVE-THRU IS BEING PROPOSED ON A SITE WITH A TOTAL APPROXIMATE LOT AREA OF 101,361 SF (2.33 ACRES). A 4,855 SF BUILDING FOOTPRINT FOR THE PROPOSED RESTAURANT IS TO BE LOCATED ON THE EASTERN PORTION OF THE SITE AND WORK WILL INCLUDE ASPHALT-PAVED PARKING, DRIVING AREAS WITH A CONCRETE PAVED DRIVE-THRU, AND UNDERGROUND UTILITIES FOR STORM, SANITARY, WATER, POWER, GAS, AND COMMUNICATIONS ARE PART OF THE PROPOSAL. ALSO, SIDEWALK AND DRIVEWAY IMPROVEMENTS AROUND THE SITE WILL BE INCLUDED AS PART OF AN ODOT PERMIT.

ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH CITY OF CORNELIUS DESIGN STANDARDS AND STANDARD CONSTRUCTION SPECIFICATIONS.

BASIS OF BEARING

BEARINGS BASED ON OREGON COORDINATE REFERENCE SYSTEM PORTLAND ZONE, NORTH AMERICAN DATUM OF NAD83/2011 (EPOCH 2010.0000)

DATUM

NORTH AMERICAN VERTICAL DATUM OF 1929 (NAVD29)

PROJECT TEAM

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Portland, Oregon 97204
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REGISTERED PROFESSIONAL ENGINEER
82613 PE
OREGON
JUN. 16, 2010
MICHAEL D. TOWLE
EXPIRATION DATE: 06/30/26
REVIEW

CHICK-FIL-A
HWY 8 & 4TH AVE
CORNELIUS, OREGON

FSR# 05889

REVISION SCHEDULE

NO.	DATE	DESCRIPTION

CIVIL'S PROJECT #	16076.01
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DATE	OCTOBER 2024
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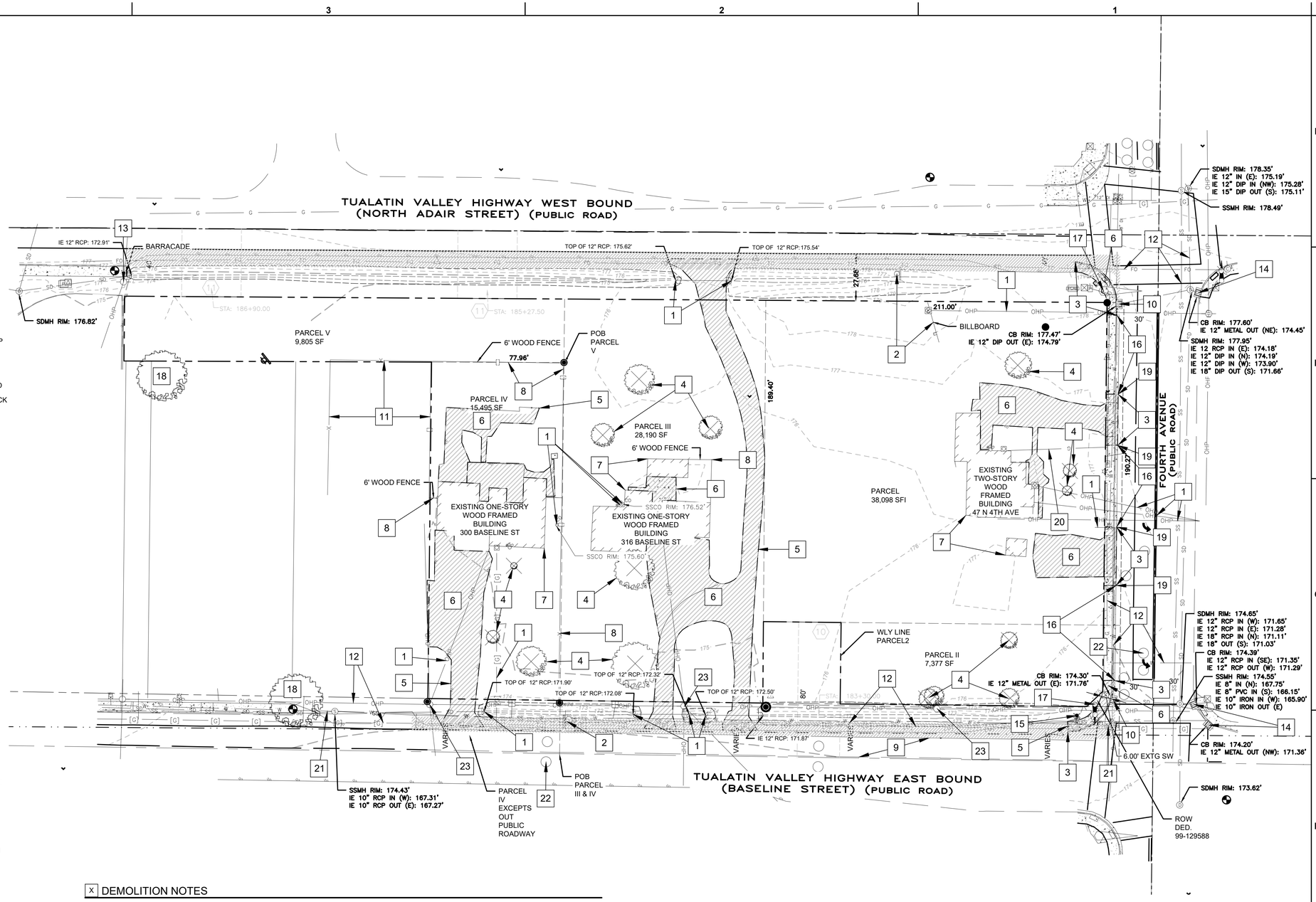
SHEET
COVER SHEET
SHEET NUMBER
C0.0

DESIGN REVIEW

c:\dowl_pw\d0417129\SC-CS-CV-16076.dwg PLOT DATE 2024-10-4 08:53 SAVED DATE 2024-10-02 15:30 USER: elewis

LEGEND

- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PARKING STRIPES
- ROAD STRIPING
- FLOW LINE CURB
- STANDARD CURB
- EDGE OF PAVEMENT
- EDGE OF CONCRETE
- WATER
- STORM SEWER
- GAS
- ELECTRIC
- SANITARY SEWER
- CENTERLINE
- RIGHT OF WAY BOUNDARY LINE
- PROPOSED PROPERTY LINE
- EASEMENT
- LOT/PARCEL LINE
- SAW CUT LINE
- PAVEMENT REMOVAL AREA
- BUILDING TO BE REMOVED
- FOUND MONUMENT-ALUMINUM CAP
- FOUND MONUMENT-BRASS CAP
- FOUND MONUMENT - MAG NAIL
- FOUND MONUMENT - 5/8" IRON ROD
- FOUND MONUMENT - HUB AND TACK
- SIGN
- TREE - DECIDUOUS
- POWER METER
- POWER VAULT
- POWER JUNCTION BOX
- LIGHT-LAMP POST
- POWER CABINET
- OVERHEAD POWER LINE POLE
- SANITARY SEWER MANHOLE
- STORM CATCH BASIN
- STORM MANHOLE
- STORM CLEANOUT
- STORM TRAPPED INLET
- FIRE HYDRANT
- WATER METER
- WATER VALVE
- GAS VALVE
- SPRINKLER HEAD
- IRRIGATION CONTROL VALVE
- CATV RISER
- SURVEY MONUMENT
- TREE TO BE REMOVED



GENERAL NOTES:

1. THE LOCATION OF EXISTING UNDERGROUND UTILITY FACILITIES SHOWN HEREON ARE BASED ON LOCATE MARKS REQUESTED FOR THIS SURVEY PER ONE CALL PUBLIC LOCATE TICKET NOS. 24126271, 24126284, & 24126303. THE SURVEYOR ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF THE DELINEATION OF SUCH UNDERGROUND UTILITIES BY THE RESPECTIVE UTILITY OWNERS, NOR FOR THE EXISTENCE OF BURIED OBJECTS WHICH ARE NOT SHOWN ON THE PLAN. ALL UTILITY LOCATIONS SHOULD BE FIELD VERIFIED PRIOR TO CONSTRUCTION.
2. FIELD WORK WAS COMPLETED ON MAY 24, 2024. STORM DRAINAGE AND SANITARY SEWER PIPE SIZES WERE OBSERVED FROM THE SURFACE WHERE VISIBLE. SIZES MAY VARY. REFER TO CITY OF CORNELIUS PROVIDED PLANS OR CONTRACTOR TO VERIFY.
3. EASEMENTS SHOWN HEREON WERE PROVIDED BY FIRST AMERICAN TITLE INSURANCE CO. COMMITMENT NO. NCS-1218431-SD DATED APRIL 29, 2024.
4. THIS DOES NOT REPRESENT A BOUNDARY SURVEY UNDER ORS 209.250, PRELIMINARY SURVEY INVESTIGATION MAY HAVE DETERMINED THE LOCATION OF RECORD BOUNDARY LINES AS THEY FIT UPON FOUND AND SHOWN MONUMENTS
5. EXISTING SURVEY MONUMENTS ARE TO BE PROTECTED DURING CONSTRUCTION OR REPLACED IN ACCORDANCE WITH OREGON REVISED STATUTES 209.140-209.155

UNDERGROUND ACCURACY STATEMENT

THE UNDERGROUND UTILITIES SHOWN HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND EXISTING DRAWINGS. THE SURVEYOR MAKES NO GUARANTEES THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED, ALTHOUGH WE CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE. DUE TO THE HAZARDOUS NATURE AND APPLICABLE OSHA REQUIREMENTS REGARDING CONFINED SPACES, IT IS NOT DOWL POLICY TO SEND FIELD STAFF INTO UTILITY MANHOLES TO RETRIEVE DEPTH AND SIZE INFORMATION. INFORMATION SHOWN HEREON IS SUBJECT TO AN UNCERTAINTY IN ACCURACY DEPENDING ON DEPTH, SIZE, FLOW, AND CONSTRUCTION OF MANHOLES. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITY LINES.

[X] DEMOLITION NOTES

1. REMOVE EXISTING UTILITIES.
2. REMOVE EXISTING SIGNAGE/BILLBOARD.
3. DEMOLISH EXISTING CURB AS SHOWN ON PLAN.
4. REMOVE EXISTING TREE.
5. PROPOSED SAWCUT LINE.
6. PROPOSED ASPHALT OR CONCRETE PAVEMENT REMOVAL AREA.
7. DEMOLISH AND CLEAR EXISTING BUILDING, INCLUDING UTILITY CONNECTIONS.
8. REMOVE EXISTING FENCE.
9. REMOVE EXISTING ROAD STRIPING.
10. REMOVE EXISTING CATCH BASIN.
11. PROTECT EXISTING FENCE IN PLACE.
12. PROTECT EXISTING UTILITIES.
13. PROTECT EXISTING POWER POLE.
14. PROTECT EXISTING CATCH BASIN.
15. ABANDON A PORTION OF THE EXISTING FIRE LINE TO HYDRANT. PROTECT HYDRANT. SEE UTILITY PLAN FOR NEW LOCATION OF PROPOSED TIE IN.
16. PROTECT EXISTING CURB AND SIDEWALK.
17. RELOCATE PUBLIC SIGNAL AND EQUIPMENT, SEE SITE PLAN FOR NEW LOCATION.
18. PROTECT EXISTING TREE.
19. PROPOSED SAWCUT LINE TO NEAREST PANEL JOINT FOR REMOVING EXISTING DRIVEWAYS.
20. DEMOLISH EXISTING GAS LATERAL UNTIL 5' FROM FACE OF PROPOSED BUILDING AND STUB, AND INSTALL NEW METER. PROTECT REST OF EXISTING GAS LINE. CONTRACTOR TO POTHOLE AND CONFIRM SIZE, ELEVATION, AND LOCATION PRIOR TO CONSTRUCTION. CONTRACTOR TO COORDINATE CONNECTION WITH UTILITY PROVIDER AND MEP. SEE UTILITY PLAN C5.0 FOR MORE DETAILS.
21. REMOVE EXISTING 4" WATER LINE ALONG WEST BASELINE STREET FROM PROPERTY LINE UNTIL EXISTING LATERAL AT 4TH AVE & BASELINE ST INTERSECTION.
22. PROTECT EXISTING DETECTOR LOOPS AND REPLACE ANY DAMAGED BY CONSTRUCTION ACTIVITIES, TYP.
23. EXISTING POWER POLES TO BE REMOVED AND OVERHEAD LINE UNDERGROUNDED.

30 0 30 60
SCALE IN FEET

Chick-fil-A
5200 Buffington Road
Atlanta, Georgia
30349-2998

DOWL
309 SW 6TH AVENUE, #700
Portland, Oregon 97204
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REGISTERED PROFESSIONAL ENGINEER
82613 PE
OREGON
JUN. 16, 2010
MICHAEL L. TOWLE
REVIEW
EXPIRATION DATE: 06/30/26

CHICK-FIL-A
HWY 8 & 4TH AVE
CORNELIUS, OREGON

FSR# 05889

REVISION SCHEDULE

NO.	DATE	DESCRIPTION

CIVIL'S PROJECT # 16076.01
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SHEET
EXISTING CONDITIONS & DEMO PLAN

SHEET NUMBER
C1.0

DESIGN REVIEW

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TUALATIN VALLEY HIGHWAY WEST BOUND
(NORTH ADAIR STREET)

EXISTING EASEMENT LINE

EXISTING EASEMENT LINE

EXISTING ROADWAY CENTERLINE

EXISTING ROW LINE

40.00' HALF WIDTH ROW

S89°37'47"E
259.16'

S89°37'59"E
118.49'

S89°37'51"E
201.00'

10.00' TO ROW DEDICATION

STA: 186+90.00

STA: 185+27.50

PARCEL V
9,805 SF (0.225 AC)

TAXLOT:
1N333CC03000

N0°38'10"E
38.21'

S89°47'50"E
181.20'

S89°47'50"E
77.96'

37.45'
S0°38'10"W

EXISTING BENCHMARK

EXISTING PROPERTY LINE

EXISTING LOT LINE

PARCEL III
28,190 SF (0.647 AC)

30.00' HALF WIDTH ROW

EXISTING LOT LINE

N0°25'33"E
189.40'

EXISTING ROW LINE

229.27'
S0°38'10"W

FOURTH AVENUE

PARCEL IV
15,495 SF (0.356 AC)

PARCEL
38,098 SFI (0.875 AC)

EXISTING PROPERTY LINE

TAXLOT:
1N333CC02900

TAXLOT:
1N333CC02800

TAXLOT:
1N333CC02700

TAXLOT:
1N333CC02600

TAXLOT:
1N333CC02400

198.32'
S0°38'10"W

199.10'
S0°38'10"W

EXISTING ROADWAY CENTERLINE

EXISTING LOT LINE

45.77'
N89°19'29"W

S89°21'50"E
154.53'

S0°25'33"W
48.00'

N0°39'55"E
48.00'

PARCEL II
7,377 SF (0.169 AC)

TAXLOT:
1N333CC02500

229.27'
S0°38'10"W

S46°19'55"W
12.88'

EXISTING ROW LINE

77.96'
N89°10'30"W

119.36'
N89°15'27"W

STA: 183+30.00

32.00' HALF WIDTH ROW

EXISTING EASEMENT LINE

N89°24'21"W
145.34'

EXISTING ROADWAY CENTERLINE

TUALATIN VALLEY HIGHWAY EAST BOUND
(BASELINE STREET)

LEGEND:

S89°13'30"E
197.31'

EXISTING PROPERTY/LOT LINE

N

20 0 20 40
SCALE IN FEET

Chick-fil-A
5200 Buffington Road
Atlanta, Georgia
30349-2998

DOWL
309 SW 6TH AVENUE, #700
Portland, Oregon 97204
971-280-8641

REGISTERED PROFESSIONAL ENGINEER
82613 PE
OREGON
JUN. 16, 2010
MICHAEL D. TOWLE
EXPIRATION DATE: 06/30/26
REVIEW

CHICK-FIL-A
HWY 8 & 4TH AVE
CORNELIUS, OREGON

FSR# 05889

REVISION SCHEDULE

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CIVIL'S PROJECT # 16076.01
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DATE OCTOBER 2024
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DESIGN REVIEW

SHEET
EXISTING LOT PLAN

SHEET NUMBER
C1.1

c:\dowl_pw\d0417129\SC-CS-EX-16076.dwg PLOT DATE 2024-10-4 08:53 SAVED DATE 2024-10-03 10:28 USER: dlewis

TUALATIN VALLEY HIGHWAY WEST BOUND
(NORTH ADAIR STREET)

EXISTING ROADWAY CENTERLINE

EXISTING ROW LINE

40.00' HALF WIDTH ROW

S89°37'47"E
259.16'

STA: 186+90.00

S89°37'51"E
578.65'

S89°37'59"E
118.49'

STA: 185+27.58

S89°37'51"E
201.00'

0.50' TO ROW DEDICATION

PROPOSED 8.00' PUE

EXISTING PROPERTY LINE

PARCEL V
9,805 SF (0.225 AC)

N0°38'10"E
38.21'

S89°47'50"E
181.20'

EXISTING BENCHMARK

S89°47'50"E
77.96'

37.45'
S0°38'10"W

30.00' HALF WIDTH ROW

PARCEL III
28,190 SF (0.647 AC)

EXISTING LOT LINE TO BE VACATED

EXISTING LOT LINE TO BE VACATED

EXISTING ROW LINE

229.27'
S0°38'10"W

FOURTH AVENUE

EXISTING LOT LINE TO BE VACATED

N0°25'33"E
189.40'

PARCEL IV
15,495 SF (0.356 AC)

PARCEL
38,098 SFI (0.875 AC)

EXISTING PROPERTY LINE

TAXLOT:
1N333CC02900

TAXLOT:
1N333CC02800

TOTAL CONSOLIDATED LOT
AREA: 98257 SF (2.256 AC)

199.10'
S0°38'10"W

198.32'
S0°38'10"W

EXISTING ROADWAY CENTERLINE

N0°38'02"E
196.32'

EXISTING LOT LINE TO BE VACATED

45.77'
N89°19'29"W

S89°21'50"E
154.53'

S0°25'33"W
48.00'

N0°39'55"E
48.00'

N0°39'55"E
46.00'

PARCEL II
7,377 SF (0.169 AC)

229.27'
S0°38'10"W

EXISTING ROW LINE

PROPOSED 2.00' ROW DEDICATION

8.00' PROPOSED PUE

N0°25'33"E
46.00'

S46°19'55"W
12.88'

PROPOSED 8.00' PUE

S89°13'30"E
197.31'

37.29'
N89°10'30"W

118.36'
N89°15'27"W

STA: 183+30.00

S89°24'24"E
147.39'

PROPOSED 2.00' ROW DEDICATION

PROPOSED 34.00' HALF WIDTH ROW

N89°24'21"W
145.34'

N46°19'55"E
10.01'

TUALATIN VALLEY HIGHWAY EAST BOUND
(BASELINE STREET)

EXISTING ROADWAY CENTERLINE

LEGEND:

S89°13'30"E
197.31'
PROPOSED PROPERTY LINE BEARING AND DISTANCE

S89°13'30"E
197.31'
BEARING AND DISTANCE FOR EXISTING PROPERTY LINE/LOT LINE TO BE ADJUSTED/CONSOLIDATED

N

20 0 20 40
SCALE IN FEET

Chick-fil-A
5200 Buffington Road
Atlanta, Georgia
30349-2998

DOWL
309 SW 6TH AVENUE, #700
Portland, Oregon 97204
971-280-8641

REGISTERED PROFESSIONAL ENGINEER
82613 PE
OREGON
JUN. 16, 2010
MICHAEL D. TOWLE
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CHICK-FIL-A
HWY 8 & 4TH AVE
CORNELIUS, OREGON

FSR# 05889

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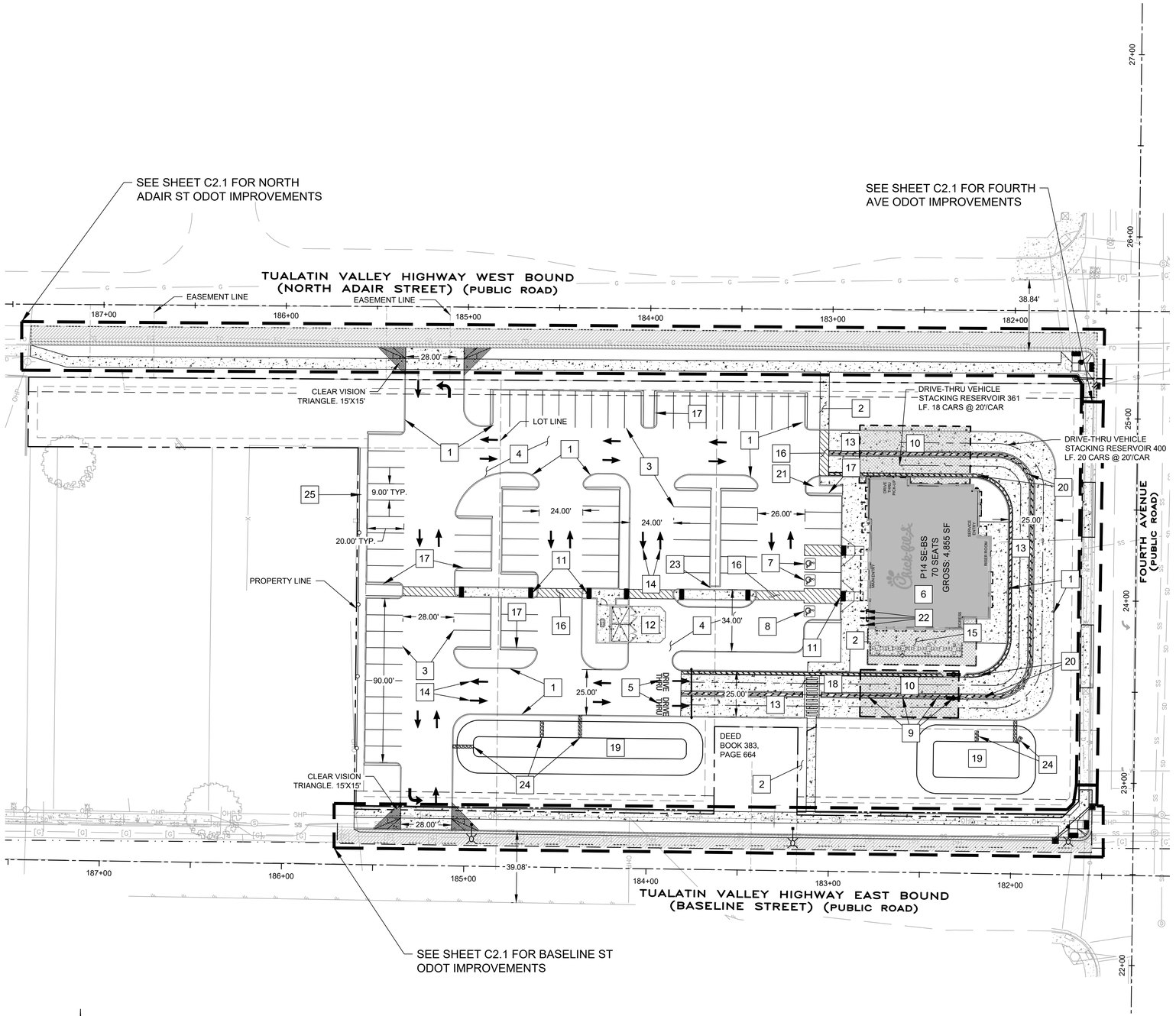
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SHEET
PRELIMINARY PLAT

SHEET NUMBER
C1.2

DESIGN REVIEW

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LEGEND

- PARKING STRIPES
- ROAD STRIPING
- EXISTING FLOW LINE CURB
- EXISTING TOP OF CURB
- EDGE OF PAVEMENT
- EDGE OF CONCRETE
- PROPOSED STANDARD CURB
- W — WATER
- SD — STORM SEWER
- G — GAS
- E — ELECTRIC
- SS — SANITARY SEWER
- CENTERLINE
- RIGHT OF WAY BOUNDARY LINE
- PROPOSED PROPERTY LINE
- EASEMENT
- LOT/PARCEL LINE
- SAW CUT LINE
- PROPOSED CONCRETE
- PROPOSED LANDSCAPING
- PROPOSED ASPHALT RESTORATION
- SIGN
- TREE - DECIDUOUS
- PUBLIC SIGNAL
- STORM CATCH BASIN
- FIRE HYDRANT

CONSTRUCTION NOTES

1. PROPOSED STANDARD CONCRETE CURB AND GUTTER, TYP.
2. PROPOSED STANDARD CONCRETE SIDEWALK PER ODOT DETAIL, TYP.
3. PROPOSED 4" WHITE PAINTED PARKING STRIPE, TYP.
4. PROPOSED ASPHALT PAVEMENT SURFACE.
5. PROPOSED DRIVE-THRU PAVEMENT MARKINGS.
6. PROPOSED BUILDING. REFER TO ARCHITECTURAL PLANS FOR DETAILS.
7. PROPOSED STANDARD A.D.A. STALL AND SIGNAGE.
8. PROPOSED VAN ACCESSIBLE A.D.A. STALL AND SIGNAGE.
9. PROPOSED DRIVE-THRU EQUIPMENT AND SIGNAGE, TYP. SEE ARCHITECTURAL PLANS.
10. PROPOSED DRIVE-THRU CANOPY. SEE ARCHITECTURAL PLANS FOR MORE INFO.
11. PROPOSED A.D.A. RAMP, TYP.
12. PROPOSED TRASH ENCLOSURE AND STORAGE AREA WITH CONCRETE APRON. SEE ARCHITECTURAL PLANS FOR MORE INFO.
13. PROPOSED DRIVE-THRU CONCRETE.
14. PROPOSED WHITE PAINTED DIRECTIONAL ARROWS, TWO COATS MINIMUM, TYP.
15. PROPOSED COVERED CONCRETE PATIO W/ OUTDOOR TABLES & SEATING. SEE ARCHITECTURAL PLANS FOR MORE INFO.
16. PROPOSED CROSSWALK STRIPING TO BE 4" YELLOW STRIPING SPACED 2' O.C. @ 36°, TYP.
17. PROPOSED 12" LANDSCAPE AND IRRIGATION PROTECTION EXTENSION, TYP.
18. PROPOSED CROSS WALK STRIPING.
19. PROPOSED STORMWATER FACILITY. SEE SHEET C4.0 FOR MORE INFO.
20. PROPOSED DRIVE-THRU STRIPING, TYP.
21. PROPOSED FLAG POLE.
22. PROPOSED BIKE PARKING, 3 RACKS 6 STALLS TOTAL.
23. PROPOSED 2' WIDE FLOW THROUGH LANDSCAPE ISLAND
24. PROPOSED OUTFALL PROTECTION.
25. PROPOSED 6.0' TALL BLACK VINYL CHAIN-LINK DECORATIVE FENCE.

SITE PARKING STATISTICS

PROPOSED BUILDING AREA:	4,855 SF
PROPOSED OUTDOOR SEATING AREA:	1,185 SF
TOTAL:	6,040 SF
TOTAL STALLS REQUIRED:	12.4 STALLS PER 1,000 SF 75 (MAXIMUM)
TOTAL STALLS PROVIDED:	74
STANDARD STALLS	70
ADA STALLS (9'X19')	3 (1 VAN ACCESSIBLE)

N

30 0 30
SCALE IN FEET

Chick-fil-A
5200 Buffington Road
Atlanta, Georgia
30349-2998

DOWL
309 SW 6TH AVENUE, #700
Portland, Oregon 97204
971-280-8641

REGISTERED PROFESSIONAL ENGINEER
82613 PE
OREGON
JUN. 16, 1989
MICHAEL D. TOWLE
REVIEW
EXPIRATION DATE: 06/30/26

CHICK-FIL-A
HWY 8 & 4TH AVE
CORNELIUS, OREGON

FSR# 05889

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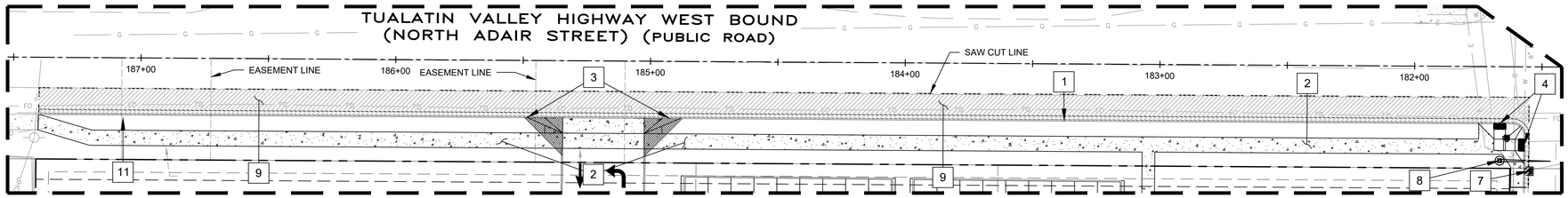
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SHEET
SITE PLAN

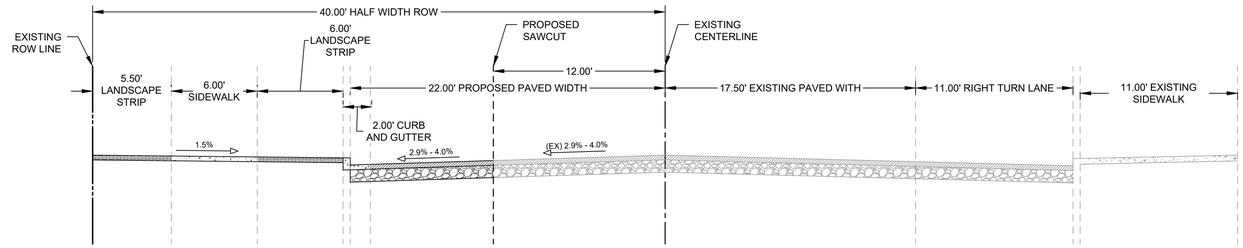
SHEET NUMBER
C2.0

DESIGN REVIEW

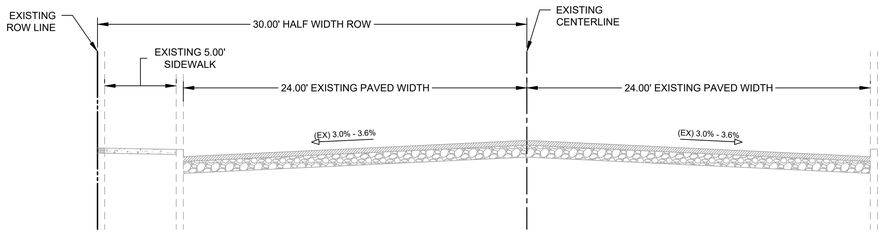
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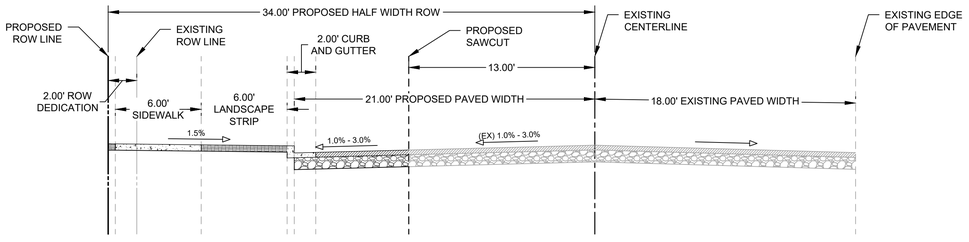
NORTH ADAIR ST IMPROVEMENTS
SCALE: 1" = 25'



NORTH ADAIR ST TYPICAL SECTION
NOT TO SCALE

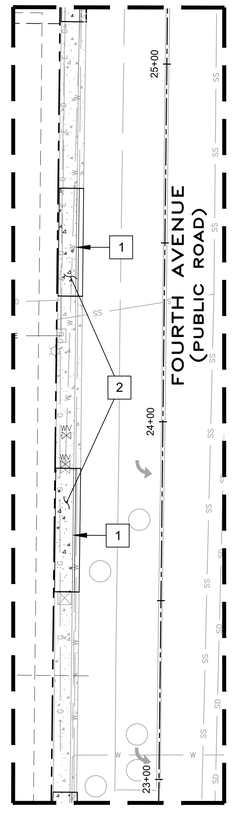


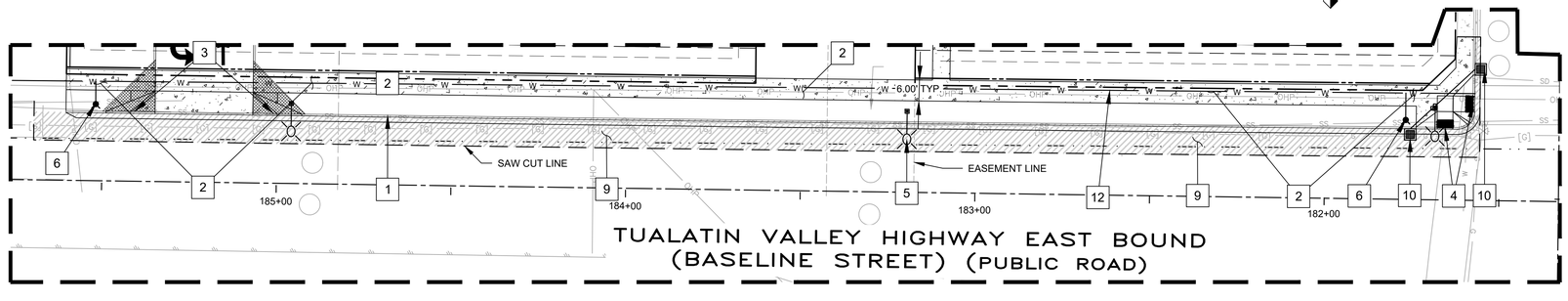
FOURTH AVE TYPICAL SECTION
NOT TO SCALE



BASELINE ST TYPICAL SECTION
NOT TO SCALE

FOURTH AVE IMPROVEMENTS
SCALE: 1" = 20'





BASELINE ST IMPROVEMENTS
SCALE: 1" = 20'

LEGEND

- PARKING STRIPES
- ROAD STRIPING
- EXISTING FLOW LINE CURB
- EXISTING TOP OF CURB
- EDGE OF PAVEMENT
- EDGE OF CONCRETE
- PROPOSED STANDARD CURB
- W — WATER
- SD — STORM SEWER
- G — GAS
- E — ELECTRIC
- SS — SANITARY SEWER
- CENTERLINE
- RIGHT OF WAY BOUNDARY LINE
- PROPOSED PROPERTY LINE
- EASEMENT
- LOT/PARCEL LINE
- SAW CUT LINE
- PROPOSED CONCRETE
- PROPOSED LANDSCAPING
- PROPOSED ASPHALT RESTORATION
- SIGN
- TREE - DECIDUOUS
- PUBLIC SIGNAL
- STORM CATCH BASIN
- FIRE HYDRANT

CONSTRUCTION NOTES

1. PROPOSED STANDARD CONCRETE CURB AND GUTTER, TYP.
2. PROPOSED STANDARD CONCRETE SIDEWALK PER ODOT DETAIL, TYP.
3. PROPOSED STANDARD CONCRETE DRIVEWAY.
4. PROPOSED A.D.A. RAMP, TYP.
5. PROPOSED STREET LIGHT, TYP. SEE LIGHTING PLANS FOR MORE INFO.
6. PROPOSED PUBLIC FIRE HYDRANT.
7. PROPOSED CURB INLET.
8. PROPOSED INSTALLATION OF RELOCATED PUBLIC SIGNAL AND EQUIPMENT.
9. PROPOSED RESTORATION OF EXISTING ASPHALT, TYP.
10. PROPOSED CATCH BASIN.
11. PROPOSED INLET CATCH BASIN PER CWS STANDARD DETAIL CG-30.
12. PROPOSED 8" WATER MAIN

Chick-fil-A
5200 Buffington Road
Atlanta, Georgia
30349-2998

DOWL
309 SW 6TH AVENUE, #700
Portland, Oregon 97204
971-280-8641

REGISTERED PROFESSIONAL ENGINEER
82613 PE
OREGON
JUN. 16, 2010
MICHAEL D. TOWLE
EXPIRATION DATE: 06/30/26
REVIEW

CHICK-FIL-A
HWY 8 & 4TH AVE
CORNELIUS, OREGON

FSR# 05889

REVISION SCHEDULE

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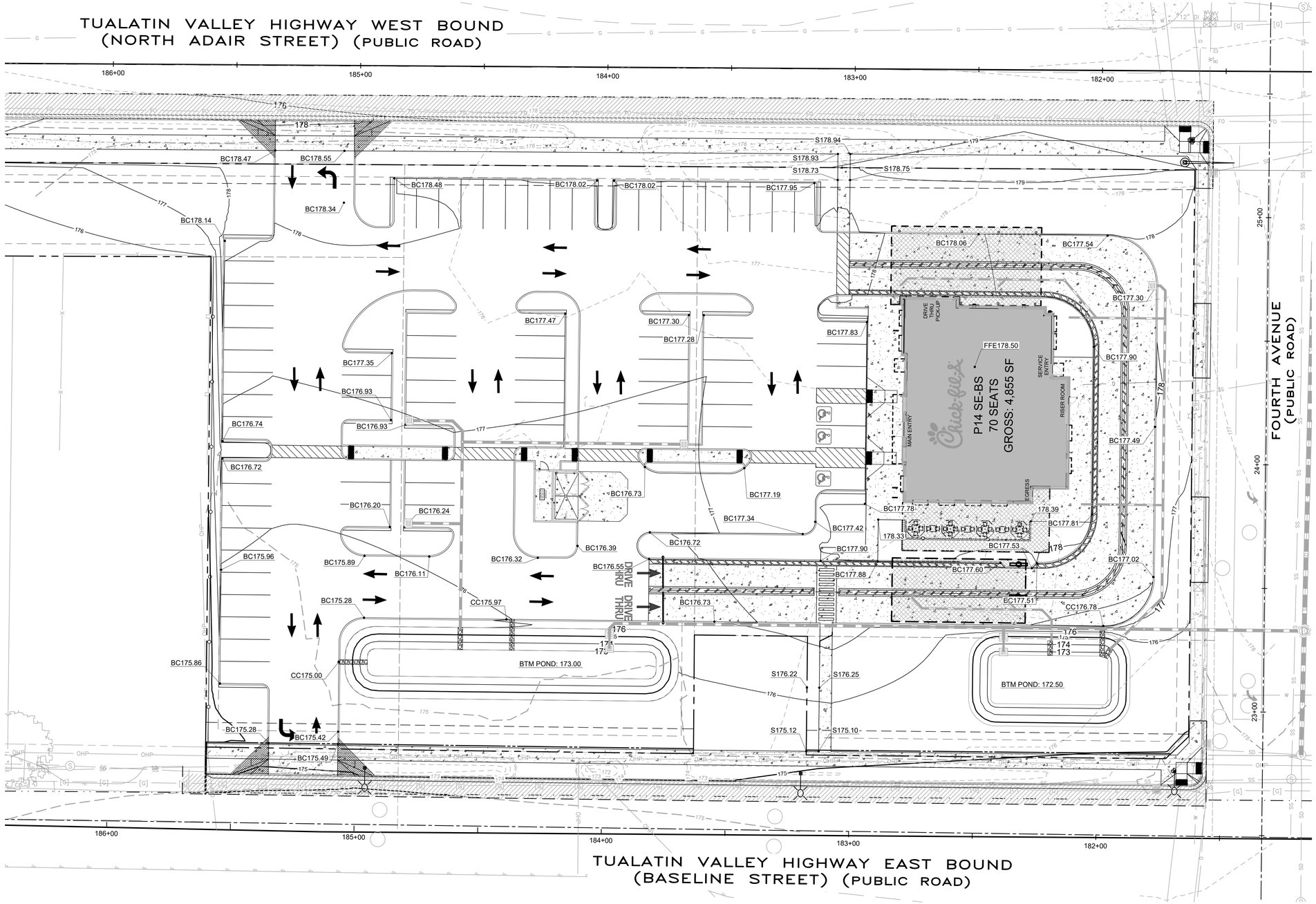
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SHEET
PUBLIC IMPROVEMENT PLAN

SHEET NUMBER
C2.1

DESIGN REVIEW

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LEGEND

205	PROPOSED MAJOR CONTOUR LINE
204	PROPOSED MINOR CONTOUR LINE
205	EXISTING MAJOR CONTOUR LINE
204	EXISTING MINOR CONTOUR LINE
	PROPOSED GRADE BREAK
	FLOW LINE CURB
	BACK OF CURB
11.90	PROPOSED SPOT ELEVATION PER ABBREVIATION TABLE BELOW
(11.90)	EXISTING SPOT ELEVATION PER ABBREVIATION TABLE BELOW

ABBREVIATION TABLE

BC:	BOTTOM OF CURB ELEVATION
BW:	BOTTOM OF WALL
FFE:	FINISH FLOOR ELEVATION
R:	RIM
S:	SPOT ELEVATION
TC:	TOP OF CURB ELEVATION
TW:	TOP OF WALL

*ALL CURBS HAVE 6" EXPOSURE UNLESS OTHERWISE NOTED.

ADA NOTE

PAVEMENT IN ADA PARKING AREA TO HAVE A MAXIMUM SLOPE OF 2% IN ANY DIRECTION.

N

20 0 20
SCALE IN FEET

Chick-fil-A
5200 Buffington Road
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CORNELIUS, OREGON

FSR# 05889

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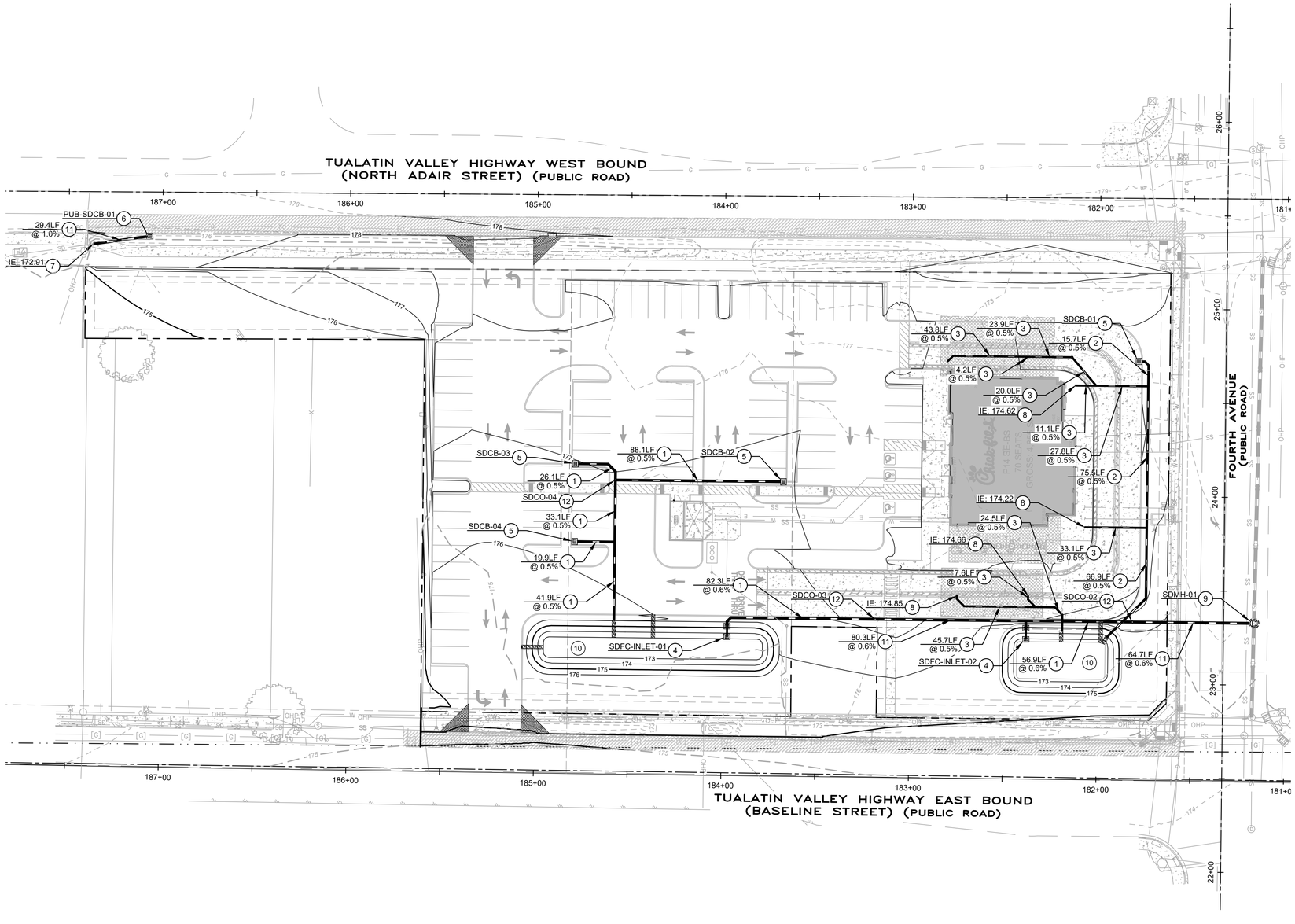
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SHEET
GRADING PLAN

SHEET NUMBER
C3.0

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LEGEND

- PROPOSED PROPERTY LINE
- G — PROPOSED GAS LINE
- SS — PROPOSED SANITARY SEWER LINE
- PROPOSED STORM DRAIN LINE
- W — PROPOSED DOMESTIC WATER LINE
- FW — PROPOSED FIRE WATER LINE
- E — PROPOSED POWER(ELECTRIC) LINE
- PROPOSED COMMUNICATIONS LINE
- EXISTING POWER, GAS AND PHONE IN SHARED TRENCH
- PROPOSED FIRE DEPARTMENT CONNECTION
- PROPOSED HYDRANT
- WM — PROPOSED WATER METER
- PROPOSED WATER VALVE
- DC — PROPOSED DCDA
- PROPOSED SANITARY SEWER CLEAN OUT
- PROPOSED STORM SEWER CATCH BASIN
- PROPOSED STORM SEWER CLEAN OUT

(#) STORMWATER KEYNOTES

1. PROPOSED 12-INCH C900 PIPE. SEE PLAN FOR LENGTH AND SLOPE.
2. PROPOSED 10-INCH PVC D3034 PIP. SEE PLAN FOR LENGTH AND SLOPE.
3. PROPOSED 8-INCH PVC D3034 PIP. SEE PLAN FOR LENGTH AND SLOPE.
4. PROPOSED DRY BASIN FLOW CONTROL STRUCTURE
5. PROPOSED TRAPPED CATCH BASIN
6. PROPOSED PUBLIC CURB INLET
7. PROPOSED CONNECTION TO EXISTING 12" RCP LINE. SEE PLAN FOR INVERT.
8. PROPOSED ROOF/CANOPY DRAIN CONNECTION. SEE PLAN FOR INVERT.
9. PROPOSED PUBLIC MANHOLE TO BE INSTALLED ON EXISTING STORM LINE.
10. PROPOSED EXTENDED DRY BASIN
11. PROPOSED 12-INCH RCP PIPE. SEE PLAN FOR LENGTH AND SLOPE. NEW PIPE TO MATCH EXISTING PIPE'S ALIGNMENT.
12. PROPOSED STORM CLEANOUT

N

30 0 30 60
SCALE IN FEET

Chick-fil-A
5200 Buffington Road
Atlanta, Georgia
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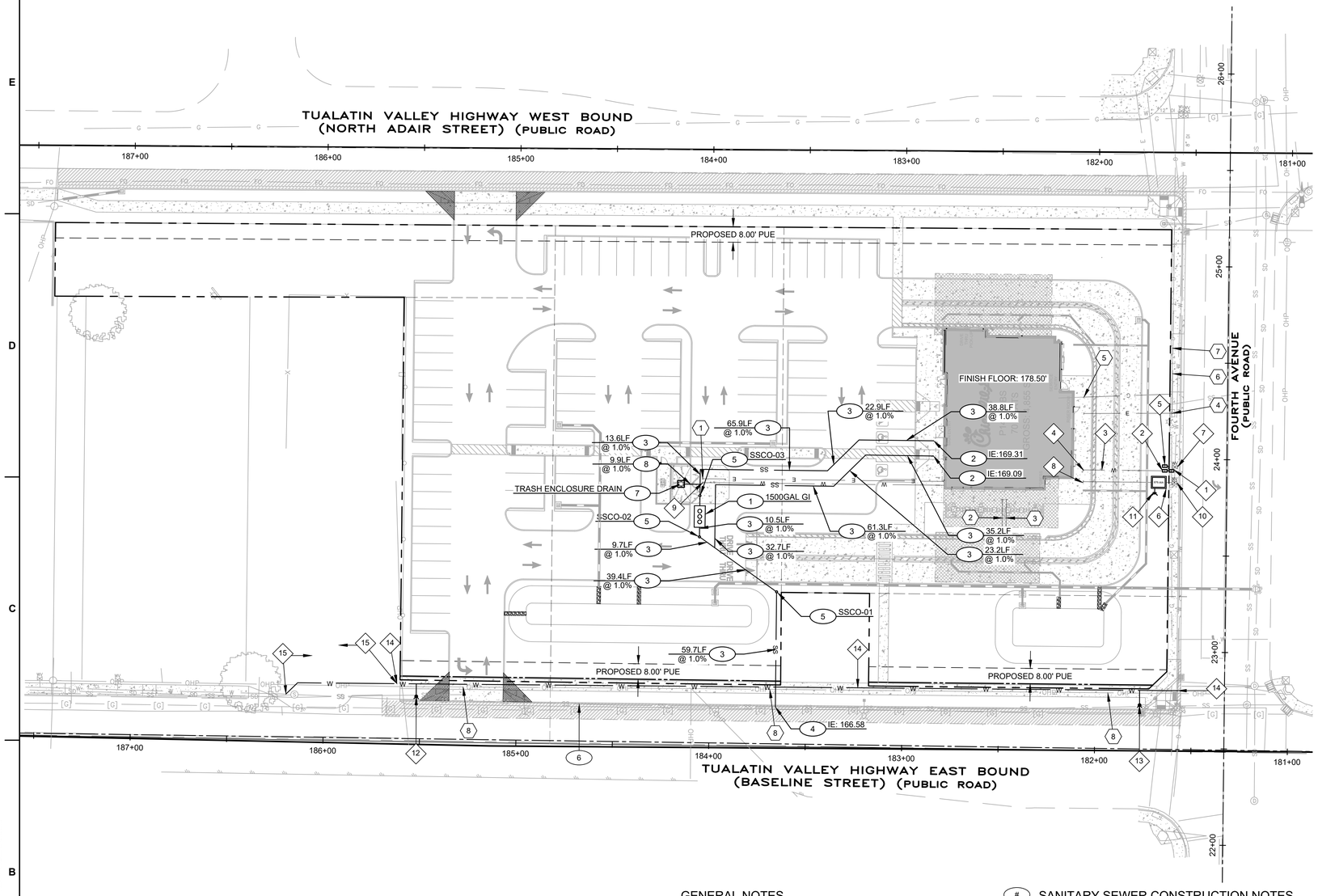
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DESIGN REVIEW

SHEET
STORM PLAN

SHEET NUMBER
C4.0

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LEGEND

- PROPOSED PROPERTY LINE
- EXISTING GAS LINE
- PROPOSED GAS LINE
- EXISTING SANITARY SEWER LINE
- PROPOSED SANITARY SEWER LINE
- EXISTING STORM DRAIN LINE
- EXISTING DOMESTIC WATER LINE
- PROPOSED DOMESTIC WATER LINE
- EXISTING FIBER OPTICS LINE
- PROPOSED POWER (ELECTRIC) LINE
- EXISTING OVERHEAD POWER LINE
- PROPOSED FIRE DEPARTMENT CONNECTION
- PROPOSED FIRE HYDRANT
- PROPOSED WATER VALVE
- PROPOSED SANITARY SEWER CLEAN OUT
- PROPOSED CATCH BASIN
- SANITARY SEWER MANHOLE
- POWER METER
- POWER VAULT
- POWER JUNCTION BOX
- POWER CABINET
- OVERHEAD POWER LINE POLE

(#) WATER CONSTRUCTION NOTES

1. PROPOSED DOMESTIC WATER SERVICE CONNECTION AND 1.5" DOMESTIC METER. CONTRACTOR TO PROVIDE NEW TAP AND METER TO MAIN LINE.
2. PROPOSED 2" DOMESTIC BACKFLOW PREVENTION.
3. PROPOSED 2" DOMESTIC WATER SERVICE LINE.
4. PROPOSED DOMESTIC WATER CONNECTION TO BUILDING. LINE TO BE STUBBED 5' FROM FACE OF BUILDING.
5. PROPOSED 1" IRRIGATION BACKFLOW POINT OF CONNECTION.
6. PROPOSED 6" FIRE SERVICE AND BACKFLOW DEVICE.
7. PROPOSED 2" TAP ON EXISTING MAIN.
8. PROPOSED FIRE CONNECTION TO THE BUILDING UNTIL 5' FROM FACE OF BUILDING AND STUB.
9. PROPOSED 3/4" WATER CONNECTION TO TRASH ENCLOSURE.
10. PROPOSED 6" TAP ON EXISTING MAIN.
11. PROPOSED FDC.
12. PROPOSED NEW FIRE HYDRANT AND CONNECTION TO NEW 8" WATER LINE.
13. NEW CONNECTION FROM EXISTING FIRE HYDRANT TO NEW 8" WATER LINE.
14. PROPOSED 8" WATER MAIN.
15. PROPOSED 8" WATER MAIN. WORK TO BE COMPLETED BY CFA AND REIMBURSED BY THE CITY.

(#) FRANCHISE UTILITY CONSTRUCTION NOTES

1. PROPOSED POWER SERVICE TO TRASH ENCLOSURE.
2. PROPOSED POWER SERVICE TO CANOPY.
3. PROPOSED GAS SERVICE TO CANOPY.
4. CONNECT TO EXISTING POWER JUNCTION BOX AND RUN ELECTRICAL CONDUIT TO BUILDING. CONTRACTOR TO COORDINATE CONNECTION WITH UTILITY PROVIDER AND MEP.
5. DEMOLISH EXISTING GAS LATERAL UNTIL 5' FROM FACE OF BUILDING AND STUB, AND INSTALL NEW METER. CONTRACTOR TO POTHOLE AND CONFIRM SIZE, ELEVATION, AND LOCATION PRIOR TO CONSTRUCTION. CONTRACTOR TO COORDINATE CONNECTION WITH UTILITY PROVIDER AND MEP.
6. PROTECT EXISTING POWER LINE, TYP.
7. PROTECT EXISTING GAS LINE, TYP.
8. EXISTING OVERHEAD UTILITY LINE TO BE UNDERGROUNDED

GENERAL NOTES

1. SEE STORM WATER PLAN, SHEET C4.0 FOR MORE INFORMATION ON STORM UTILITIES AND FACILITIES.
2. CLEANOUTS TO BE INSTALLED ON STORM AND SEWER EVERY 90LF OF PIPE.

ALL PRIVATE SEWER CONNECTIONS NOT MADE AT A STRUCTURE TO BE MADE WITH A WYE FITTING

(#) SANITARY SEWER CONSTRUCTION NOTES

1. PROPOSED 1500 GALLON OLD CASTLE GREASE INTERCEPTOR VENTED BACK TO BUILDING. VAULT LID TO NOT EXCEED 24" IN GRADE RINGS. SEE TABLE THIS SHEET FOR MORE INFORMATION.
2. PROPOSED SANITARY STUB 5' FROM BUILDING.
3. PROPOSED 6" PVC D3034 SANITARY SEWER LINE. SEE PLAN FOR LENGTH AND SLOPE.
4. PROPOSED CONNECTION TO EXISTING 10" PVC SANITARY SEWER LINE WITH GASKETED TAPPING SADDLE.SEE PLAN FOR INVERT.
5. PROPOSED SANITARY SEWER CLEANOUT. SEE TABLE THIS SHEET FOR MORE INFORMATION.
6. PROTECT EXISTING SANITARY SEWER LINE, TYP.
7. PROPOSED FLOOR DRAIN FOR TRASH ENCLOSURE. DRAIN WILL BE TRAPPED AND VENTED.
8. PROPOSED 3" PVC D3034 SANITARY SEWER LINE TO CONNECT FLOOR DRAIN TO GREASE INTERCEPTOR. SEE PLAN FOR LENGTH AND SLOPE.

30 0 30 60
SCALE IN FEET

Chick-fil-A
5200 Buffington Road
Atlanta, Georgia
30349-2998

DOWL
309 SW 6TH AVENUE, #700
Portland, Oregon 97204
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REGISTERED PROFESSIONAL ENGINEER
82613 PE
OREGON
JUN. 16, 2010
MICHAEL J. TOWLE
REVIEW
EXPIRATION DATE: 06/30/26

CHICK-FIL-A
HWY 8 & 4TH AVE
CORNELIUS, OREGON

FSR# 05889

REVISION SCHEDULE

NO.	DATE	DESCRIPTION

CIVIL'S PROJECT # 16076.01
PRINTED FOR SCHEMATIC DESIGN
DATE OCTOBER 2024
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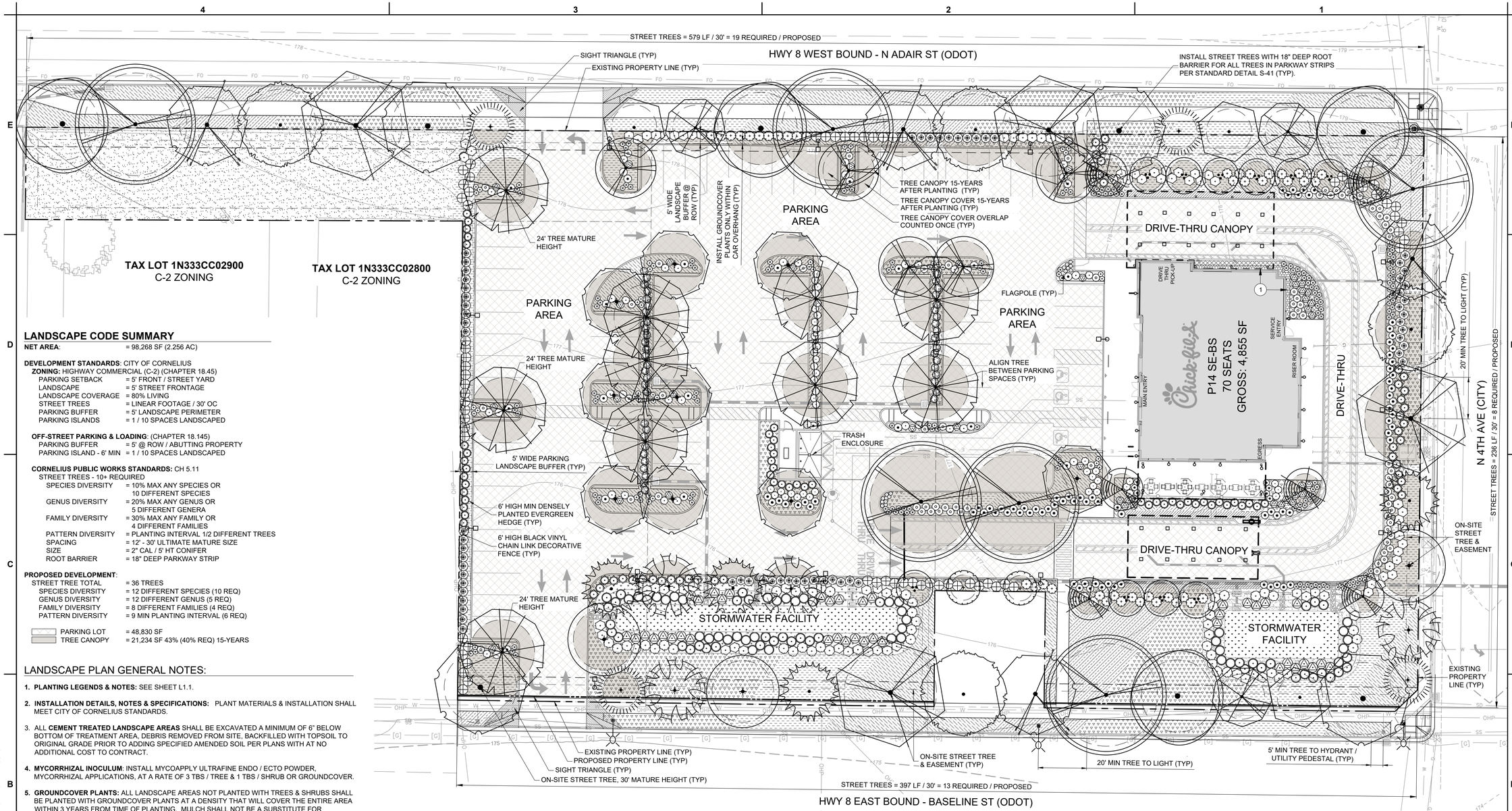
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DESIGN REVIEW

SHEET
UTILITY PLAN

SHEET NUMBER
C5.0

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LANDSCAPE CODE SUMMARY

NET AREA: = 98,268 SF (2.256 AC)

DEVELOPMENT STANDARDS: CITY OF CORNELIUS
- **ZONING:** HIGHWAY COMMERCIAL (C-2) (CHAPTER 18.45)
  - PARKING SETBACK = 5' FRONT / STREET YARD
  - LANDSCAPE = 5' STREET FRONTAGE
  - LANDSCAPE COVERAGE = 80% LIVING
  - STREET TREES = LINEAR FOOTAGE / 30' OC
  - PARKING BUFFER = 5' LANDSCAPE PERIMETER
  - PARKING ISLANDS = 1 / 10 SPACES LANDSCAPED

OFF-STREET PARKING & LOADING: (CHAPTER 18.145)
- PARKING BUFFER = 5' @ ROW / ABUTTING PROPERTY
- PARKING ISLAND - 6' MIN = 1 / 10 SPACES LANDSCAPED

CORNELIUS PUBLIC WORKS STANDARDS: CH 5.11
- STREET TREES - 10+ REQUIRED
  - SPECIES DIVERSITY = 10% MAX ANY SPECIES OR 10 DIFFERENT SPECIES
  - GENUS DIVERSITY = 20% MAX ANY GENUS OR 5 DIFFERENT GENERA
  - FAMILY DIVERSITY = 30% MAX ANY FAMILY OR 4 DIFFERENT FAMILIES
  - PATTERN DIVERSITY = PLANTING INTERVAL 1/2 DIFFERENT TREES
  - SPACING = 12' - 30' ULTIMATE MATURE SIZE
  - SIZE = 2" CAL / 5' HT CONIFER
  - ROOT BARRIER = 18" DEEP PARKWAY STRIP

PROPOSED DEVELOPMENT:
- STREET TREE TOTAL = 36 TREES
  - SPECIES DIVERSITY = 12 DIFFERENT SPECIES (10 REQ)
  - GENUS DIVERSITY = 12 DIFFERENT GENUS (5 REQ)
  - FAMILY DIVERSITY = 8 DIFFERENT FAMILIES (4 REQ)
  - PATTERN DIVERSITY = 9 MIN PLANTING INTERVAL (6 REQ)

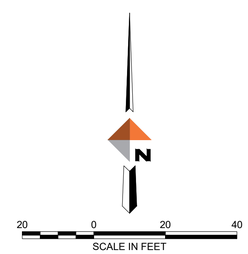
- PARKING LOT = 48,830 SF
- TREE CANOPY = 21,234 SF 43% (40% REQ) 15-YEARS

LANDSCAPE PLAN GENERAL NOTES:

1. **PLANTING LEGENDS & NOTES:** SEE SHEET L1.1.
2. **INSTALLATION DETAILS, NOTES & SPECIFICATIONS:** PLANT MATERIALS & INSTALLATION SHALL MEET CITY OF CORNELIUS STANDARDS.
3. ALL **CEMENT TREATED LANDSCAPE AREAS** SHALL BE EXCAVATED A MINIMUM OF 6" BELOW BOTTOM OF TREATMENT AREA, DEBRIS REMOVED FROM SITE, BACKFILLED WITH TOPSOIL TO ORIGINAL GRADE PRIOR TO ADDING SPECIFIED AMENDED SOIL PER PLANS WITH AT NO ADDITIONAL COST TO CONTRACT.
4. **MYCORRHIZAL INOCULUM**: INSTALL MYCOAPPLY ULTRAFINE ENDO / ECTO POWDER, MYCORRHIZAL APPLICATIONS, AT A RATE OF 3 TBS / TREE & 1 TBS / SHRUB OR GROUNDCOVER.
5. **GROUNDCOVER PLANTS:** ALL LANDSCAPE AREAS NOT PLANTED WITH TREES & SHRUBS SHALL BE PLANTED WITH GROUNDCOVER PLANTS AT A DENSITY THAT WILL COVER THE ENTIRE AREA WITHIN 3 YEARS FROM TIME OF PLANTING. MULCH SHALL NOT BE A SUBSTITUTE FOR GROUNDCOVER & IS ALLOWED IN ADDITION TO GROUNDCOVER PLANTS.
6. PLANT MATERIAL DELIVERED TO THE SITE SHALL MEET THE CURRENT VERSION OF THE AMERICAN NURSERYMAN'S SPECIFICATION ASSOCIATION STANDARDS FOR ALL SPECIFIED BALLED & BURLAPPED AND CONTAINER SIZES.
7. CONTRACTOR SHALL OBTAIN WRITTEN APPROVAL FROM THE PROJECT LANDSCAPE ARCHITECT FOR ALL PLANT MATERIAL SUBSTITUTIONS PRIOR TO PURCHASE. PLANT SUBSTITUTIONS THAT ARE NOT APPROVED IN WRITING, OR DO NOT COMPLY WITH THE PROJECT DRAWINGS AND SPECIFICATIONS WILL BE REJECTED BY THE LANDSCAPE ARCHITECT AT NO COST TO THE OWNER.
8. **IRRIGATION**: IRRIGATION SYSTEM SHALL BE A FULLY AUTOMATIC UNDERGROUND SYSTEM UTILIZING DRIPLINE & ROOT ZONE WATERING, ET BASED CONTROLLER, FLOW SENSOR & MASTER VALVE. ALL PROPOSED PLANT MATERIALS SHALL BE WATERED (MAY TO OCTOBER) & MAINTAINED FOR A MINIMUM OF ONE (1) FULL GROWING SEASON AFTER THE DATE OF SUBSTANTIAL COMPLETION. TREES SHALL BE WATERED AT A RATE OF 15 GALLONS PER TREE ONCE PER WEEK, SHRUBS & GROUNDCOVERS AT A RATE OF 1" PER WEEK OR AS NECESSARY TO MAINTAIN VIGOROUS HEALTHY GROWTH.
9. **MAINTENANCE**: LANDSCAPE MAINTENANCE PERIOD BEGINS IMMEDIATELY AFTER THE COMPLETION OF ALL PLANTING OPERATIONS AND ACKNOWLEDGEMENT THAT ALL PUNCH LIST ITEMS HAVE BEEN COMPLETED BY THE CONTRACTOR. MAINTAIN TREES, SHRUBS, LAWNS AND OTHER PLANTS WEEKLY UNTIL FINAL ACCEPTANCE OR 90 DAYS AFTER NOTIFICATION AND ACCEPTANCE, WHICHEVER IS LONGER. MAINTENANCE SHALL INCLUDE MOWING, FERTILIZING, MULCHING, PRUNING, CULTIVATION, WEEDING, WATERING, & APPLICATION OF APPROPRIATE INSECTICIDES & FUNGICIDES NECESSARY TO MAINTAIN PLANTS & LAWNS FREE OF INSECTS & DISEASE.
   - A. RE-SET SETTLED PLANTS TO PROPER GRADE & POSITION. RESTORE PLANTING SAUCER & ADJACENT MATERIAL & REMOVE DEAD MATERIAL.
   - B. REPAIR STAKES & GUY WIRES AS REQUIRED.
   - C. CORRECT DEFECTIVE WORK AS SOON AS POSSIBLE AFTER DEFICIENCIES BECOME APPARENT & WEATHER & SEASON PERMIT.
   - D. WATER TREES, PLANTS & GROUNDCOVER BEDS WITHIN THE FIRST 24 HOURS OF INITIAL PLANTING & NOT LESS THAN TWICE PER WEEK UNTIL FINAL ACCEPTANCE.

CONSTRUCTION NOTES

1. INSTALL DECORATIVE ROCK BAND AT BUILDING.



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REGISTERED FOR REVIEW ONLY
0625
WAYNE R. IAZZETTI
OREGON
05/11/07
LANDSCAPE ARCHITECT
EXPIRES 05/31/2025

CHICK-FIL-A
HWY 8 & 4TH AVE
CORNELIUS, OREGON

FSR# 05889

REVISION SCHEDULE

NO.	DATE	DESCRIPTION

CIVIL'S PROJECT #	16076.01
PRINTED FOR	SCHEMATIC DESIGN
DATE	OCTOBER 2024
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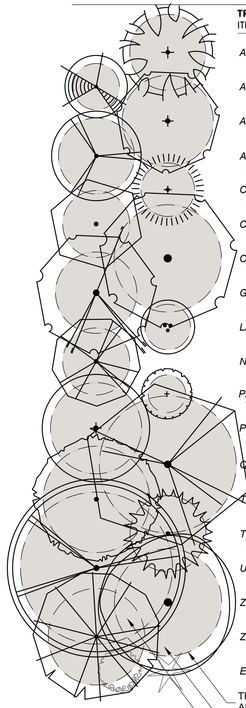
SHEET
PLANTING PLAN

SHEET NUMBER
L1.0

DESIGN REVIEW

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PLANTING LEGEND:



TREE CANOPY 15-YEARS AFTER PLANTING (TYP)
TREE CANOPY COVER 15-YEARS AFTER PLANTING (TYP)
TREE CANOPY COVER OVERLAP COUNTED ONCE (TYP)

TREES

ITEM	SIZE	QTY.	MATURE / 15 YRS PLANTING SIZE (H X W) *
ABIES GRANDIS GRAND FIR	5' - 6' HT / B&B AS SHOWN	4	80' H X 25' W / 68' H X 21.25' W (15-YR, FAST) NATIVE EVERGREEN / DROUGHT TOLERANT FAMILY - PINACEAE (PINE)
ACER GRISEUM PAPERBARK MAPLE	2" CAL / B&B AS SHOWN	6	25' H X 20' W / 16.25' H X 13' W (15-YR, SLOW) 5' BRANCHING HT / DROUGHT TOLERANT
ACER RUBRUM 'FRANK JR' REDPOINTE MAPLE	2" CAL / B&B AS SHOWN	9	45' H X 30' W / 38.25' H X 25.5' W (15-YR, FAST) 5' BRANCHING HT / HEAT TOLERANCE
ACER TRUN. X PLAT. 'KEITHSFORM' NORWEGIAN SUNSET MAPLE	2" CAL / B&B AS SHOWN	5	35' H X 25' W / 29.75' H X 21.25' W (15-YR, FAST) 5' MIN BRANCHING HT / HEAT RESISTANT
CALOCEDRUS DECURRENS INCENSE CEDAR	5' - 6' HT / B&B AS SHOWN	4	60' H X 20' W / 45' W X 15' W (15-YR, AVG) NATIVE EVERGREEN / DROUGHT TOLERANT FAMILY - CUPRESSACEAE
CARPINUS BETULUS 'FASTIGIATA' PYRAMIDAL EUROPEAN HORNBEAM	2" CAL / B&B AS SHOWN	3	35' H X 25' W / 26.25' H X 18.75' W (15-YR, AVG) 5' BRANCHING HT / DROUGHT TOLERANT FAMILY - BETULACEAE (BIRCH)
CLADRASTIS KENTUKEA AMERICAN YELLOWWOOD	2" CAL / B&B AS SHOWN	4	30' H X 40' W / 22.5' H X 30' W (15-YR, AVG) DEEP-ROOTED / DROUGHT TOLERANT FAMILY - FABACEAE (BEECH)
GINKGO BILOBA 'AUTUMN GOLD' AUTUMN GOLD GINKGO	2" CAL / B&B AS SHOWN	4	45' H X 35' W / 29.25' H X 22.75' W (15-YR, SLOW) 5' BRANCHING HT / NON-FRUITING FAMILY - GINKGOACEAE
LAGERSTROEMIA INDICA 'WHIT II' DYNAMITE CRAPE MYRTLE	2" CAL / B&B AS SHOWN	10	20' H X 15' W / 17' H X 12.75' W (15-YR, FAST) 5' MIN BRANCHING HT / POWER LINES
NYSSA SYLVATICA 'WILDFIRE' WILDFIRE TUPELO	2" CAL / B&B AS SHOWN	3	40' H X 25' W / 30' H X 18.75' W (15-YR AVG) 5' BRANCHING HT / CENTRAL LEADER FAMILY - NYSSACEAE
PARROTIA PERSICA 'VANESSA' VANESSA PERSIAN PARROTIA	2" CAL / B&B AS SHOWN	2	28' H X 14' W / 21' H X 10.5' W (15-YR, AVG) POWER LINES / DROUGHT TOLERANT
PSEUDOTSUGA MENZIESII DOUGLAS FIR	5' - 6' HT / B&B AS SHOWN	3	100' H X 30' W / 85' H X 25.5' W (15-YR FAST) NATIVE EVERGREEN / DROUGHT TOLERANT FAMILY - PINACEAE (PINE)
QUERCUS RUBRA RED OAK	2" CAL / B&B AS SHOWN	4	50' H X 45' W / 42.5' H X 38.25' W (15-YR FAST) 5' BRANCHING HT / DROUGHT TOLERANT FAMILY - FAGACEAE (BEECH)
TILIA TOMENTOSA 'STERLING' STERLING LINDEN	2" CAL / B&B AS SHOWN	4	45' H X 35' W / 38.25' H X 29.75' W (15-YR, FAST) 5' BRANCHING HT / DROUGHT TOLERANT FAMILY - MALVACEAE
TSUGA HETEROPHYLLA WESTERN HEMLOCK	5' - 6' HT / B&B AS SHOWN	4	80' H X 25' W / 68' H X 21.25' W (15-YR, FAST) NATIVE EVERGREEN / WET TOLERANT FAMILY - PINACEAE (PINE)
ULMUS AMERICANA 'JEFFERSON' JEFFERSON AMERICAN ELM	2" CAL / B&B AS SHOWN	6	70' H X 50' W / 59.5' H X 42.5' W (15-YR, FAST) OWN-ROOT ONLY / DROUGHT TOLERANT FAMILY - ULMACEAE (ELM)
ZELKOVA SERRATA 'VILLAGE GREEN' VILLAGE GREEN ZELKOVA	2" CAL / B&B AS SHOWN	4	40' H X 40' W / 30' H X 30' W (15-YR, AVG) CITY STREET TREE / DROUGHT TOLERANT FAMILY - ULMACEAE (ELM)
ZELKOVA SERRATA 'SCHMIDTLOW' WIRELESS ZELKOVA	2" CAL / B&B AS SHOWN	10	24' H X 36' W / 18' H X 27' W (15-YR, AVG) 5' BRANCHING HT / POWER LINES
EXISTING TREE TO REMAIN			CONTRACTOR TO PROTECT IN PLACE

* TREE CANOPY NOTES - APPROXIMATE 15-YEARS AFTER PLANTING TREE CANOPY IS DETERMINED BY THE FOLLOWING TREE GROWTH RATE FACTORS FOR A HEALTHY 30-YR TREE GROWN UNDER AVERAGE CITY CONDITIONS (JF SCHMIDT)
- SLOW GROWTH RATE - 0.65
- AVERAGE GROWTH RATE - 0.75
- FAST GROWTH RATE - 0.85

SHRUBS & ACCENTS

ITEM	SIZE	QTY.	MATURE SIZE (H X W) / COMMENTS
ABELIA 'EDWARD GOUCHER' EDWARD GOUCHER ABELIA	10 GAL CONT 4'-0" OC	49	6' H X 6' W / HIGH SCREEN SHRUB EVERGREEN / DROUGHT TOLERANT
ARBUTUS UNEDO 'COMPACTA' COMPACT STRAWBERRY TREE	10 GAL CONT 4'-0" OC	46	6' H X 5' W / MAINTAIN AT 3'-6" H EVERGREEN / DROUGHT TOLERANT
CALAMAGROSTIS x A. 'KARL FOERSTER' KARL FOERSTER REED GRASS	2 GAL CONT 2'-0" OC	54	4' H X 24" W / VERTICAL GRASS DROUGHT TOLERANT
CHAMAECYPARIS OBTUSA 'GRACILIS' SLENDER HINOKI FASLSE CYPRESS	3' - 4' HT. / B&B 3'-6" OC	47	8' H X 5' W / COLUMNAR EVERGREEN FULL SUN / LAYERED BRANCHES
CISTUS X PULVERULENTUS 'SUNSET' MAGENTA ROCK ROSE	5 GAL CONT 3'-0" OC	20	2' H X 4' W / EVERGREEN FULL SUN / DROUGHT TOLERANT
ILEX CRENATA 'SKY PENCIL' SKY PENCIL JAPANESE HOLLY	5 GAL CONT 2'-6" OC	8	8' H X 3' W / HIGH SCREEN SHRUB EVERGREEN
ILEX GLABRA 'SHAMROCK' SHAMROCK INKBERRY HOLLY	5 GAL CONT 3'-0" OC	46	4' H X 4' W / SMALL SHRUB EVERGREEN / DROUGHT TOLERANT
LIGUSTRUM JAPONICUM 'TEXANUM' WAXLEAF PRIVET	10 GAL CONT 4'-0" OC	68	8' H X 6' W / MAINTAIN AT 3'-6" H EVERGREEN / DROUGHT TOLERANT
MISCANTHUS 'PURPURASCENS' AUTUMN FLAME GRASS	2 GAL CONT 3'-0" OC	72	3'-6" H X 3' W / UPRIGHT ORANGE FALL COLOR / DROUGHT TOLERANT
MISCANTHUS SINENSIS 'LITTLE MISS' LITTLE MISS MAIDEN GRASS	2 GAL CONT 3'-0" OC	79	30" H X 3' W / COMPACT HABIT 2-TONE FOLIAGE / DROUGHT TOLERANT
MYRICA CALIFORNICA PACIFIC WAX MYRTLE	10 GAL CONT 4'-0" OC	62	8' H X 6' W / MAINTAIN AT 3'-6" H NATIVE EVERGREEN / DROUGHT TOLERANT
PENNISETUM A. 'HAMELN' HAMELN DWARF FOUNTAIN GRASS	2 GAL CONT 2'-0" OC	152	30" H X 2' W FULL SUN / DROUGHT TOLERANT
ROSA 'RADRAZZ' KNOCK OUT ROSE	5 GAL CONT 3'-0" OC	19	3' H X 3' W / DISEASE RESISTANT FULL SUN / DROUGHT TOLERANT
ROSMARINUS OFFICINALIS 'ARP' ARP ROSEMARY	5 GAL CONT 3'-0" OC	40	3' H X 3' W / EVERGREEN FULL SUN / DROUGHT TOLERANT
RUDBECKIA FULGIDA 'EARLY BIRD GOLD' EARLY BIRD GOLD BLACK EYED SUSAN	2 GAL 18" OC	16	2' H X 2' W / PERENNIAL YELLOW FLOWERS / DROUGHT TOLERANT
NARCISSUS 'DUTCH MASTER' DUTCH MASTER TRUMPET DAFFODIL	16 CM + 4 PER AREA	100	20" H X 6" W / BULB YELLOW FLOWERS / DROUGHT TOLERANT
COLCHICUM GIGANTEUM "THE GIANT" GIANT AUTUMN CROCUS	20 CM + 4 PER AREA	100	8" H X 6" W / BULB PURPLE FLOWERS - FALL
SPIRAEA JAPONICA 'NEON FLASH' NEON FLASH JAPANESE SPIREA	5 GAL CONT 3'-0" OC	20	3' H X 3' W / SMALL BRIGHT RED FLOWERS / DROUGHT TOLERANT
VACCINIUM OVATUM EVERGREEN HUCKLEBERRY	5 GAL CONT 3'-0" OC	41	3' H X 3' W / LOW SHRUB NATIVE EVERGREEN / DROUGHT TOLERANT
VIBURNUM TINUS 'SPRING BOUQUET' SPRING BOUQUET VIBURNUM	10 GAL CONT 4'-0" OC	62	6' H X 5' W / MAINTAIN AT 3'-6" H EVERGREEN / DROUGHT TOLERANT
EXISTING SHRUB TO REMAIN			CONTRACTOR TO PROTECT IN PLACE

GROUNDCOVERS & MISC

ITEM	SIZE	QTY.	MATURE SIZE (H X W)
ARCTOSTAPHYLOS UVA-URSI 'MASS.' MASSACHUSETTS KINNIKINICK	1 GAL CONT 2'-0" OC	8,027 SF 2,328 PLANTS	9" H X 3' W / EVERGREEN NATIVE SELECTION / DROUGHT TOLERANT
COTONEASTER DAMMERI 'LOWFAST' BEARBERRY COTONEASTER	1 GAL CONT 2'-0" OC	8,618 SF 2,499 PLANTS	12" H X 3' W / EVERGREEN DROUGHT TOLERANT
HEMEROCALLIS 'HAPPY RETURNS' HAPPY RETURNS DAYLILY	1 GAL CONT 18" OC	520 SF 266 PLANTS	18" H X 18" W / DROUGHT TOLERANT FIRE RESISTANT
NARCISSUS 'DUTCH MASTER' DUTCH MASTER TRUMPET DAFFODIL	16 CM + 9" OC	500 BULBS	20" H X 6" W / BULB YELLOW FLOWERS / DROUGHT TOLERANT
COLCHICUM GIGANTEUM 'THE GIANT' GIANT AUTUMN CROCUS	20 CM + 9" OC	500 PLANTS	8" H X 6" W / BULB PURPLE FLOWERS - FALL
VIOLA X WITTROCKIANA 'CROWN GOLDEN' CROWN GOLDEN PANSY	4" CONT 9" OC	500 PLANTS	8" X 10" / WINTER ANNUAL CLEAR GOLDEN FLOWERS
JUNIPERUS CONFERTA 'BLUE PACIFIC' BLUE PACIFIC SHORE JUNIPER	1 GAL CONT 2'-0" OC	4,161 SF 1,207 PLANTS	12" H X 3' W / LOW / EVERGREEN HEAT & DROUGHT TOLERANT
MAHONIA REPENS CREEPING MAHONIA	1 GAL CONT 2'-0" OC	8,006 SF 2,322 PLANTS	18" H X 3' W / EVERGREEN PNW NATIVE / DROUGHT TOLERANT
"NATIVE MEADOW" MIX SUNMARK SEEDS - FAIRVIEW, OR	SEED @ 1 LBS / 1,000 SF	6,733 SF 6.8 LBS	BROMUS C, FESTUCA O, ESCHSCHOLZIA C GAILLARDIA P, ACHILLEA M, DESCHAMPSIA C LUPINUS B, KOELERIA M, LINARIA M
OPHIOPOGON JAPONICUS MONDO GRASS	1 GAL CONT 12" OC	337 SF 388 PLANTS	12" H X 12" W / EVERGREEN DARK GREEN GRASS-LIKE LEAVES
NARCISSUS 'TETE-A-TETE' "TETE-A-TETE' DAFFODIL	16 CM + 9" OC	725 BULBS	8" H X 6" W / BULB YELLOW FLOWERS - SPRING
DECORATIVE ROCK BAND @ BUILDING VALLEY LANDSCAPE CENTER SURE-LOC STEEL EDGING 15" STEEL STAKES, COLOR BLACK	1'-6" X 6" 1/4" X 5" X 16'	92 SF 1.7 CY 65 LF	WASHED RIVER ROCK, SIZE 2" - 3" INSTALL OVER MIRAFI 140N NON-WOVEN GEO-TEXTILE, TUALATIN, 503-692-0606

STORMWATER FACILITY PLANTING LEGEND:

SHRUBS & GROUNDCOVERS

ITEM	SIZE	QTY.	POTENTIAL HEIGHT / PLANTING ZONE
CORNUS SERICEA RED-TWIG DOGWOOD	1 GAL. CONT. 2' HT @ 4'-0" O.C.	40	20' H / ZONE A/B SUN - PART SHADE / PNW NATIVE
MAHONIA AQUIFOLIUM OREGON GRAPE	1 GAL. CONT. 6" HT. @ 4'-0" O.C.	39	5' H / ZONE B SUN / PNW NATIVE
RIBES SANGUINEUM RED-FLOWERING CURRANT	1 GAL. CONT. 18" HT. @ 4'-0" O.C.	40	8' H / ZONE B SUN / PNW NATIVE
ROSA PISOCARPA CLUSTURED ROSE	1 GAL. CONT. 18" HT. @ 4'-0" O.C.	39	8' H / ZONE A/B SUN-PART SHADE / PNW NATIVE
SPIRAEA DOUGLASII DOUGLAS SPIREA	1 GAL CONT 18" HT. @ 4'-0" O.C.	39	6' H / ZONE A/B SUN - PART SHADE / PNW NATIVE
		197 TOTAL	

GROUNDCOVERS

ITEM	SIZE	QTY.	POTENTIAL HEIGHT / PLANTING ZONE
LOW GROW SEED MIX	SEED @ 120 LBS. / ACRE	0.09 ACRE 10.9 LBS	40% DWARF TALL FESCUE 30% DWARF PERRENIAL RYE 25% CREEPING RED FESCUE 5% COLONIAL BENT GRASS
RUSH / SEDGE MIX 33% JUNCUS PATENS 33% CAREX OBNUPTA 33% SCIRPUS MICROCARPUS	6 PLUGS/SF 6" HT PLUGS 6" HT PLUGS 6" HT PLUGS	2,200 SF 4,400 PLUGS 4,400 PLUGS 4,400 PLUGS 13,200 TOTAL	PNW NATIVE 36" H / ZONE A / SUN - PART SHADE 4" H / ZONE A / SUN - PART SHADE 24" H / ZONE A / SUN - PART SHADE

STORMWATER FACILITY LANDSCAPE SUMMARY *(CWS DESIGN AND CONSTRUCTION STANDARDS)*:

STORMWATER FACILITY	= EXTENDED DRY BASIN
GROWING MEDIUM	= SEE CIVIL SHEETS
ZONE A TOTAL	= 2,200 SF
ZONE A HERBACEOUS (6 PLUGS / SF)	= 13,200 PLUGS (13,200 PLUGS REQ)
ZONE B TOTAL	= 3,935 SF
ZONE B SHRUBS (3,935 SF X 0.05)	= 197 SHRUBS (197 SHRUBS REQ)
ZONE B GROUNDCOVER	= 100% AREAL COVERAGE

STORMWATER FACILITY PLAN NOTES:

1. STORM FACILITY PLANTING SHALL BE CONSISTENT WITH CLEAN WATER SERVICES' STANDARDS, CHAPTER 2 MAINTENANCE ASSURANCE/MAINTENANCE PERIOD INSPECTION AND COMPLETION, AND APPENDIX A: PLANTING REQUIREMENTS. REFER TO THE DESIGN AND CONSTRUCTION STANDARDS FOR SANITARY SEWER AND SURFACE WATER MANAGEMENT, AND LOW IMPACT DEVELOPMENT APPROACHES HANDBOOK FOR INSTALLATION, MONITORING, MAINTENANCE AND WARRANTY RELATED TO ALL REQUIRED WORK.
2. WEED CONTROL - PRIOR TO PLANTING, CONTROL ALL NON-NATIVE INVASIVE VEGETATION PER CLEAN WATER SERVICES' INTEGRATED PEST MANAGEMENT PLAN.
3. TIMING - CONTAINERIZED STOCK SHALL BE INSTALLED ONLY FROM FEBRUARY 1 THROUGH MAY 1 AND OCTOBER 1 THROUGH NOVEMBER 15. BARE ROOT STOCK SHALL BE INSTALLED ONLY FROM DECEMBER 15 THROUGH APRIL 15.
4.. PLACEMENT - PLANT PLACEMENT SHALL BE CONSISTENT WITH NATURALLY OCCURRING PLANT COMMUNITIES. PLACE TREES AND SHRUBS IN SINGLES OR CLUSTERS OF THE SAME SPECIES TO PROVIDE NATURAL PLANTING SCHEME. INSTALL PLANTS WITHIN EACH AREA TO ACCOUNT FOR LOCAL VARIATIONS IN HYDROLOGIC, SOIL, & SHADE CONDITIONS. PLANT ARRANGEMENT MAY FOLLOW CURVED ROWS TO FACILITATE MAINTENANCE. PLANT PLACEMENT AND SEEDING SHALL PROMOTE MAXIMUM VEGETATIVE COVER TO MINIMIZE WEED ESTABLISHMENT. PLANTING PATTERNS WILL VARY DEPENDING ON THE PRESENCE OF EXISTING VEGETATION.
5. DO NOT INSTALL DEEP ROOTING TREES AND SHRUBS IN CONFLICT WITH ABOVE- OR BELOW-GROUND UTILITIES, OR WITHIN 10 FEET OF RETAINING WALLS, INLET/OUTLET STRUCTURES OR OTHER CULVERTS.
6. TAG ALL PLANT MATERIAL FOR DORMANT SEASON IDENTIFICATION; TAGS SHALL REMAIN FOR LOCATION & INSPECTION.
7. IRRIGATION - IRRIGATE PLANTINGS AS NEEDED TO MAINTAIN GROWTH AND SURVIVAL. WATERING SHALL BE AT A MINIMUM RATE OF AT LEAST ONE (1) INCH PER WEEK FROM JUNE 15 THROUGH OCTOBER 15.
8. PLANT MONITORING - INSPECT ENHANCEMENT AND MITIGATION AREAS AREAS MINIMUM THREE (3) PER GROWING SEASON AND ONE (1) PRIOR TO ONSET OF GROWING SEASON.
9. PLANT REPLACEMENT AND PRESERVATION - MAINTAIN AT LEAST 80% SURVIVAL OF PLANTED TREES AND SHRUBS WITH ESTABLISHMENT OF 90% AERIAL COVERAGE DURING THE TWO (2) YEAR MAINTENANCE PERIOD, OR UNTIL FINAL ACCEPTANCE.
10. WEED CONTROL - ENSURE UNDESIRABLE VEGETATION COVER, INCLUDING TARGET NON-NATIVE SPECIES, IS LESS THAN 10% OF TOTAL COVER DURING THE TWO (2) YEAR PLANT MAINTENANCE PERIOD, OR UNTIL FINAL ACCEPTANCE (SEE CLEAN WATER SERVICES' INTEGRATED PEST MANAGEMENT PLAN).

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REGISTERED LANDSCAPE ARCHITECT
OREGON
WAYNE R. IAZZETTI
05/11/07
EXPIRES 05/31/2025
FOR REVIEW ONLY

CHICK-FIL-A
HWY 8 & 4TH AVE
CORNELIUS, OREGON

FSR# 05889

REVISION SCHEDULE

NO.	DATE	DESCRIPTION

CIVIL'S PROJECT #	16076.01
PRINTED FOR	SCHEMATIC DESIGN
DATE	OCTOBER 2024
DRAWN BY	WRI

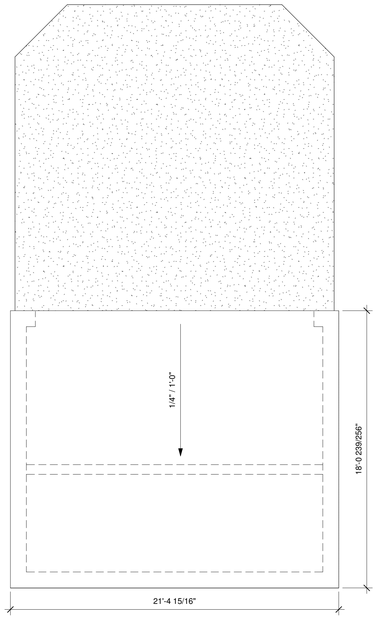
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DESIGN REVIEW

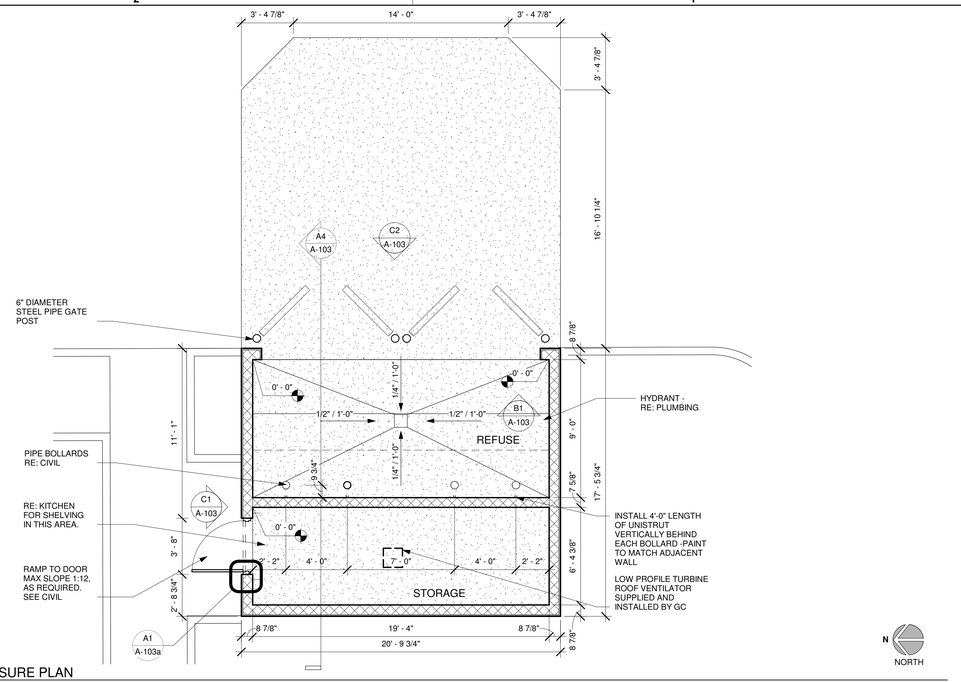
SHEET
PLANTING LEGENDS & NOTES

SHEET NUMBER
L1.1

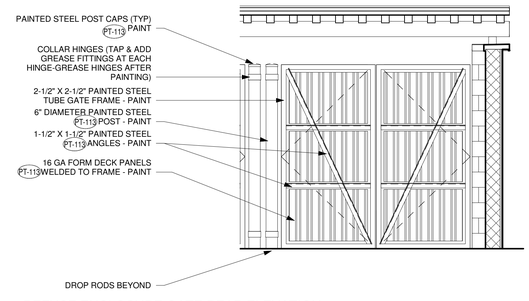
C:\dowl_pw\d0417260\ISC-LS-PLANTING-16076.dwg PLOT DATE 2024-10-22 12:48 SAVED DATE 2024-10-22 12:48 USER: wiazzetti



D3 REFUSE ENCLOSURE ROOF PLAN
1/4" = 1'-0"

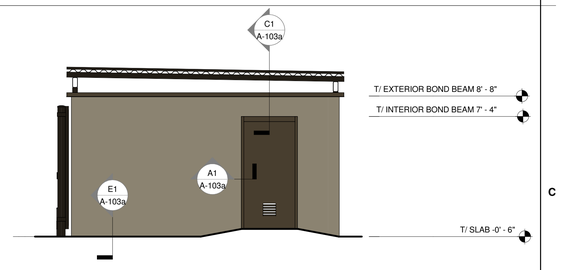


D2 REFUSE ENCLOSURE PLAN
1/4" = 1'-0"

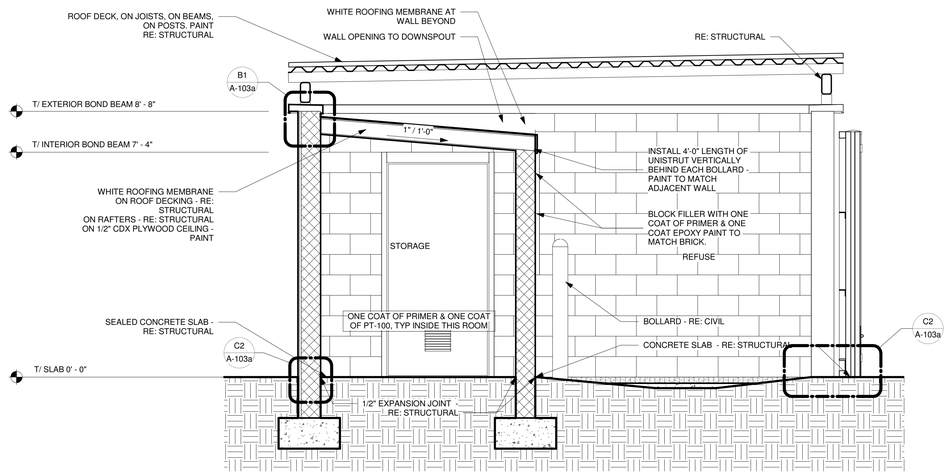


B1 REFUSE ENCLOSURE GATE REAR ELEVATION
3/8" = 1'-0"

C2 REFUSE ENCLOSURE ELEVATION
1/4" = 1'-0"



C1 Elevation 4 - a
N.T.S.



A4 REFUSE ENCLOSURE SECTION
N.T.S.

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CORNELIUS, OREGON 97113

FSR#05889

BUILDING TYPE / SIZE: P14 SE BS
RELEASE: 24.05
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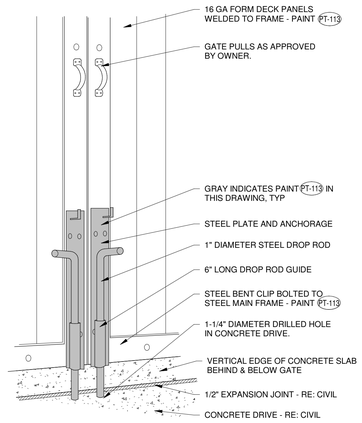
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DATE 10/08/2024
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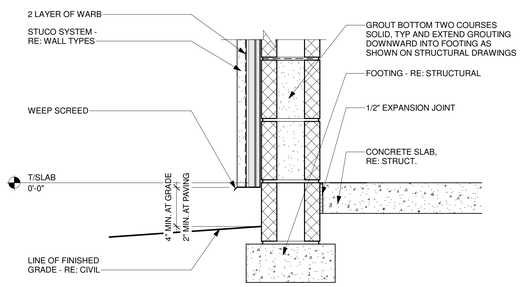
SHEET
REFUSE ENCLOSURE

SHEET NUMBER
A-103

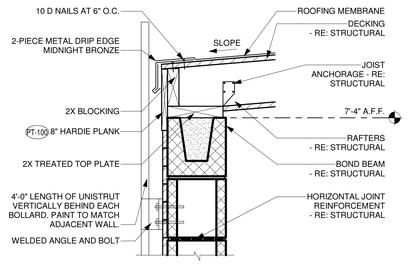
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10-SE-05889-A-103-REFUSE ENCLOSURE



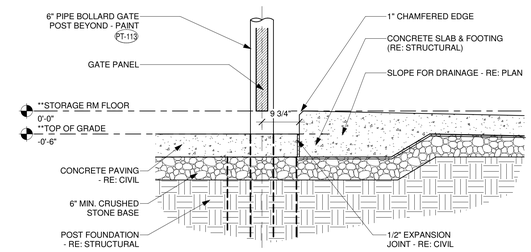
D2 REFUSE ENCOSURE DROP ROD 3-D DECK PANEL DETAIL
1/2" = 1'-0"



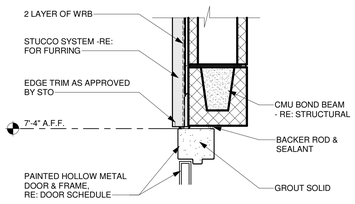
E1 REFUSE ENCLOSURE BASE DETAIL
1 1/2" = 1'-0"



D1 REFUSE ENCLOSURE DRIP EDGE
1 1/2" = 1'-0"



C2 REFUSE PAD AT CONCRETE PAVING DETAIL
3/4" = 1'-0"

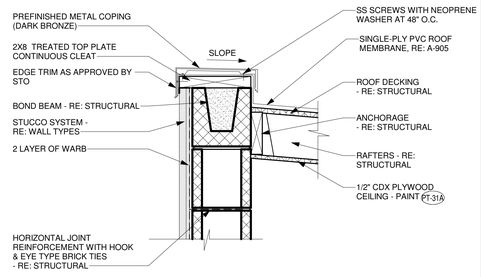


C1 REFUSE ENCLOSURE DOOR HEAD DETAIL
1 1/2" = 1'-0"

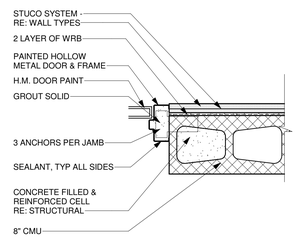
REFUSE ENCLOSURE NOTES

1. ** IN THE ARCHITECTURAL DRAWINGS, REFUSE ENCLOSURE AND MAIN BUILDING ARE BOTH NOTED WITH FINISH SLAB AT 0'-0". ACTUAL FINISH SLAB HEIGHTS WILL VARY BETWEEN MAIN BUILDING AND REFUSE ENCLOSURE. REFER TO CIVIL FOR ALL FINISH SLAB HEIGHTS.

B2 REFUSE ENCLOSURE NOTES
N.T.S.



B1 REFUSE ENCLOSURE ROOF EDGE DETAIL
1 1/2" = 1'-0"



A1 REFUSE ENCLOSURE DOOR JAMB DETAIL
1 1/2" = 1'-0"

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FSR#05889

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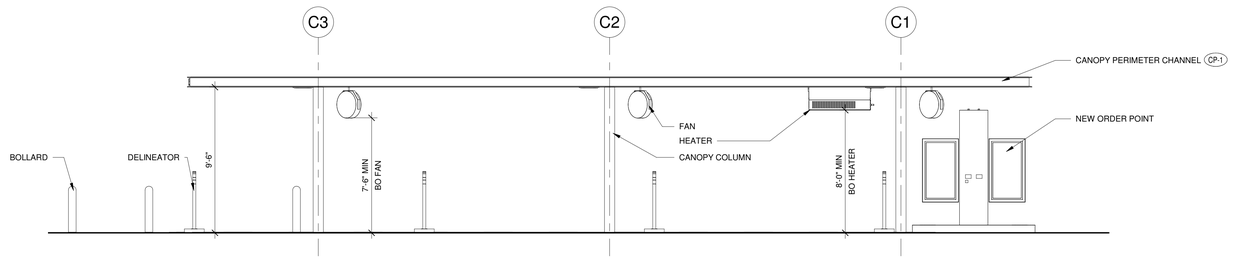
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SHEET
REFUSE ENCLOSURE

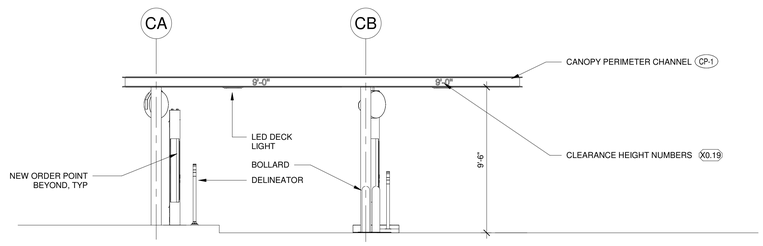
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A-103a

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10-SE-05889-A-103a REFUSE ENCLOSURE

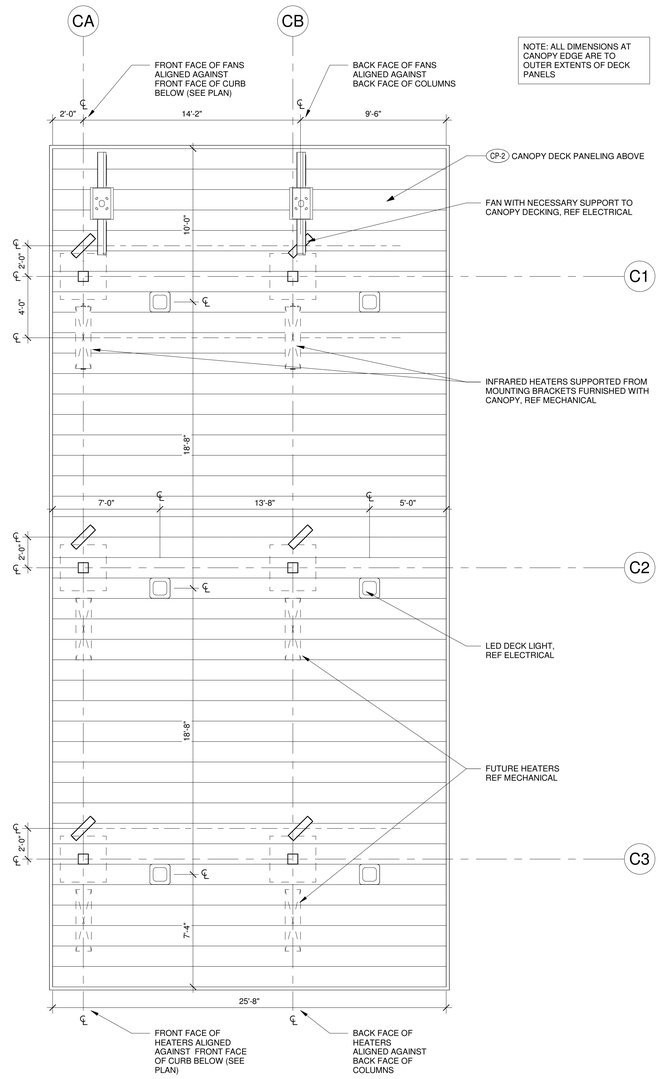
ORDER POINT EQUIPMENT SCHEDULE									
TAG	EQUIPMENT	APPLICABLE TIER 1	2	3	SUPPLIER	CONTACT	MANUFACTURER	MODEL NUMBER	COMMENTS
X0.3	BOLLARD SLEEVE	-	X	X	GC	-	INTERSTATE PRODUCTS OR EQUAL	1736YRS - EAGLE 6"	-
X0.4	OP DIGITAL MENU BOARD	-	X	X	PATTISON	Helene Hammond (613-247-5379) hhammond@pattisonsign.com	PATTISON	-	
X0.19	CLEARANCE TEXT	-	X	X	LANE OR FASHION	Larry Tolbert (705-545-7615) ltolbert@lanesupplyinc.com OR Jason Holmes (785-242-8111) jholmes@fashioninc.com	LANE OR FASHION	-	-



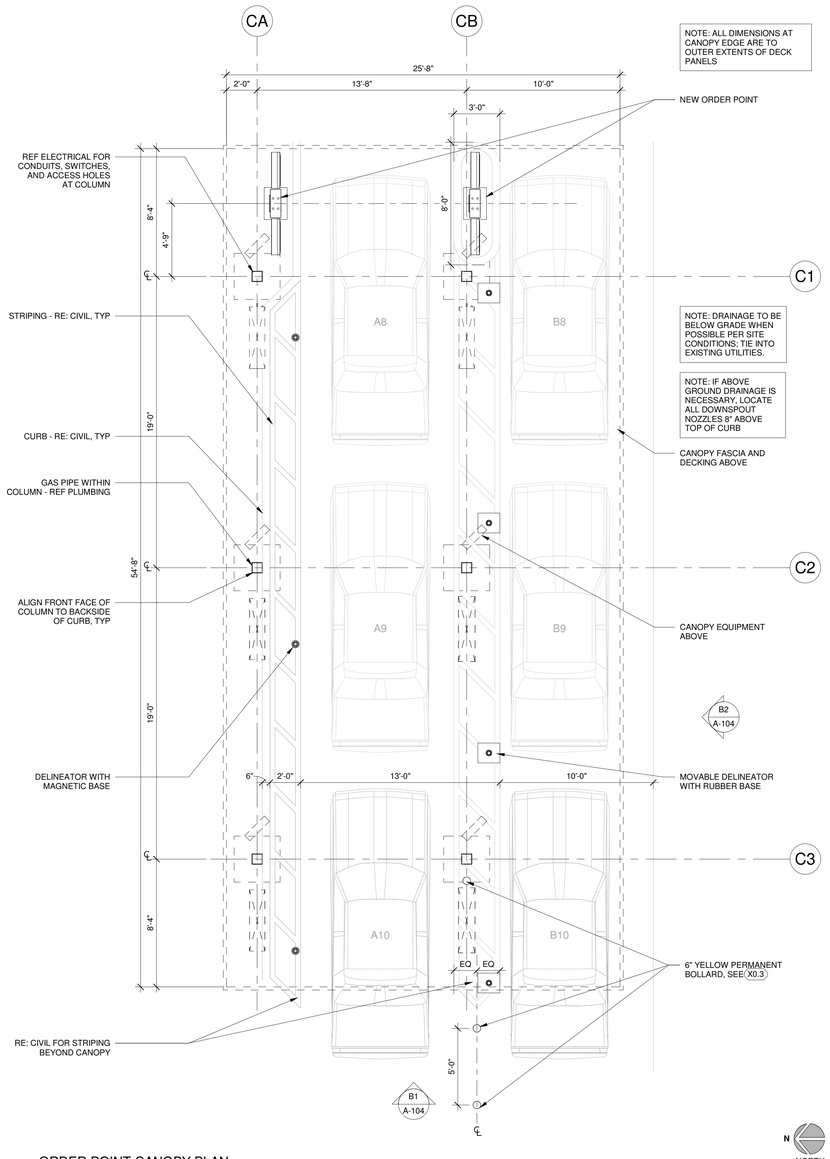
B2 SIDE ELEVATION
1/4" = 1'-0"



B1 ENTRY ELEVATION
1/4" = 1'-0"



A2 ORDER POINT CANOPY REFLECTED CEILING PLAN
1/4" = 1'-0"



A1 ORDER POINT CANOPY PLAN
1/4" = 1'-0"

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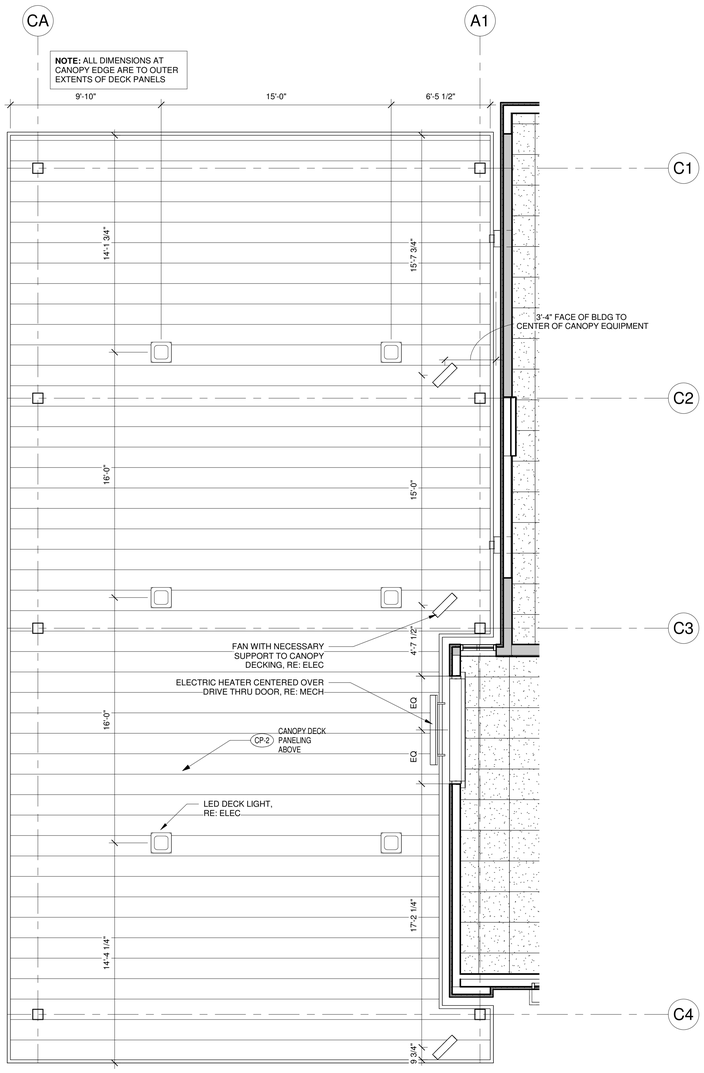
CONSULTANT PROJECT # IRV24-0057-00
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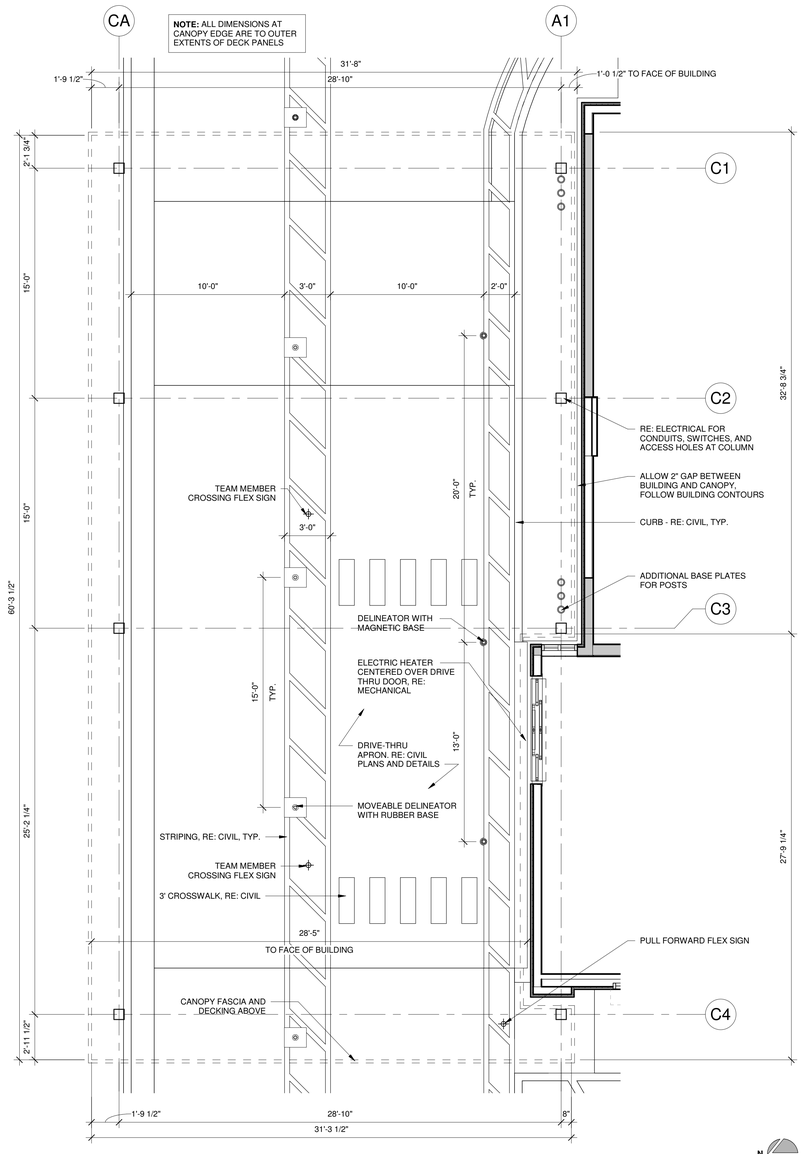
SHEET
ORDER POINT CANOPY

SHEET NUMBER
A-104

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10-SE-05889-A-104-ORDER POINT CANOPY



B4 OUTSIDE MEAL DELIVERY CANOPY REFLECTED CEILING PLAN
1/4" = 1'-0"



B2 OMD_PLAN_FLOOR
1/4" = 1'-0"

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SHEET
OUTSIDE MEAL DELIVERY CANOPY

SHEET NUMBER
A-105

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10-SE-05889-A-105-OUTSIDE MEAL DELIVERY CANOPY

FLOOR PLAN GENERAL NOTES

A.1 ALL DIMENSIONS SHOWN ARE FRAMING DIMENSIONS (FACE OF STUD/JAMB) UNLESS OTHERWISE NOTED.
A.2 FASTENERS, ANCHORS, CLIPS, STRAPS, ETC WHICH ARE IN CONTACT WITH PRESERVATIVE AND/OR FIRE TREATED WOOD SHALL BE OF G-185 HOT DIPPED ZINC-COATED GALVANIZED STEEL, STAINLESS STEEL, OR AN APPROVED EQUAL.
A.3 REFER TO CIVIL AND LANDSCAPE FOR LOCATIONS OF WALKS, BOLLARDS, LANDSCAPING AREAS, FLAG POLE, AND OTHER SITE ITEMS.
A.4 REFER TO INTERIOR ELEVATIONS FOR LOCATIONS AND TYPES OF CORNER GUARDS.
A.5 CONTRACTOR TO COORDINATE LOCATION OF POLE MOUNTED EXTERIOR CAMERA WITH STRONG SYSTEMS AND INSTALL UNDERGROUND CONDUIT AS REQUIRED. RE: ELECTRICAL.
A.6 REFER TO ACCESSIBILITY PLAN AND FURNITURE DRAWINGS FOR SEATING LAYOUT & SPECIFICATIONS. CONTACT: OWNER.
A.7 REFER TO ACCESSIBILITY PLAN AND OWNER DRAWINGS FOR CONDIMENT COUNTERS AND TRASH RECEPTACLES.
A.8 REFER TO IT WALLBOARD USER GUIDE FOR WALLBOARD INSTALLATION, IF APPLICABLE.
A.9 REFER TO MILLWORK PLAN FOR RAISED CONCRETE CURB LOCATIONS.
A.10 FREEZER AND COOLER DOORS AND HARDWARE SUPPLIED BY FREEZER/COOLER MANUFACTURER

FLOOR PLAN LEGEND:

CT CABINET
RE: ELECTRICAL

MDP RE: ELECTRICAL

STEEL WALL BY OWNER RE: FURNITURE PLANS FOR DIMENSIONS AND DETAILS

ITEM BY OWNER

SOFFIT OR BULKHEAD ABOVE RE: REFLECTED CEILING PLAN

2-SIDED BRAND ICON
RE: OWNER DRAWINGS

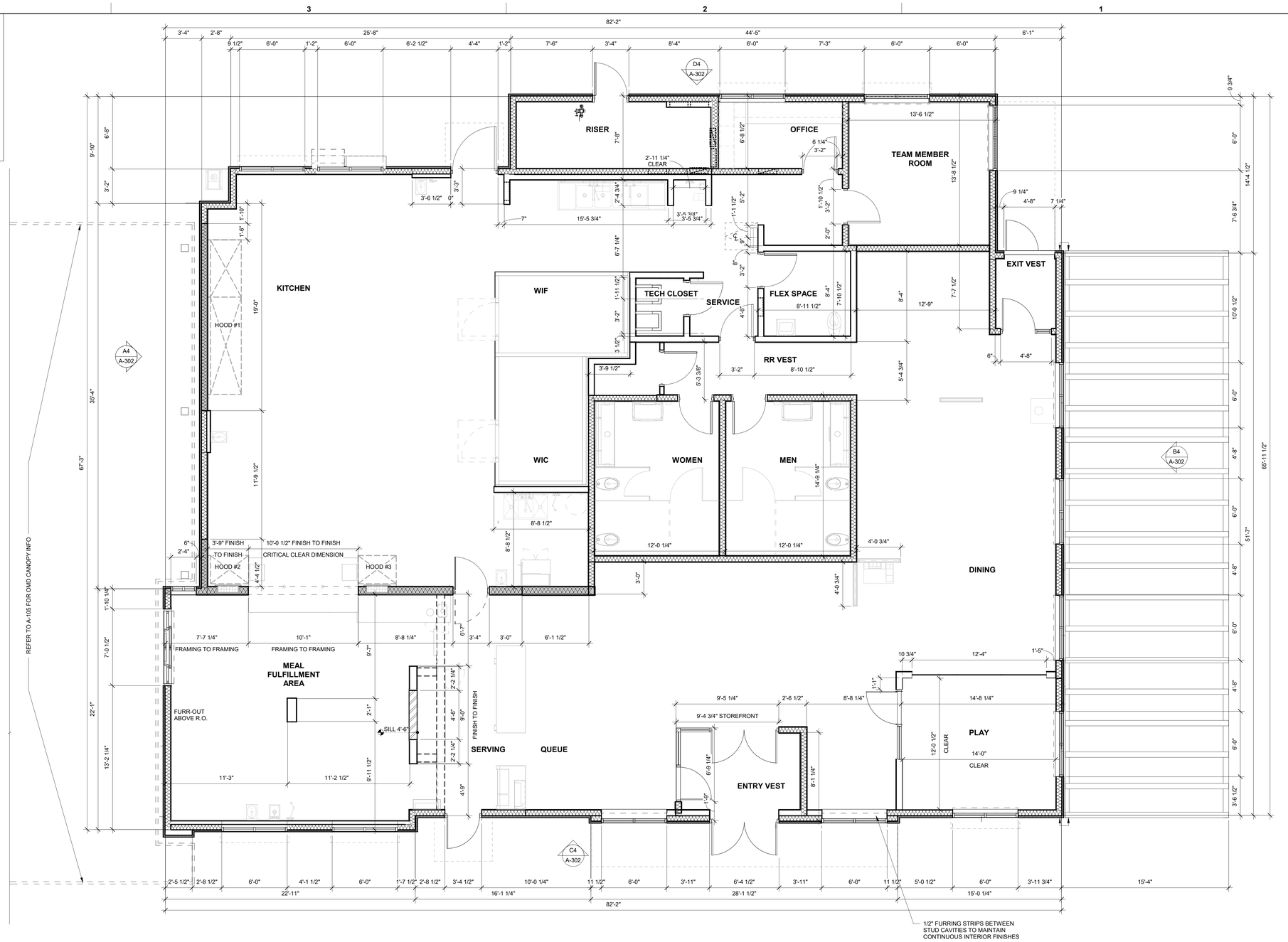
RECESSED PIN AND SLEEVE BOX, RE: A4/A620 & MEP DRAWINGS.

ELECTRICAL PANEL RE: ELECTRICAL

INSULATION SCHEDULE

LOCATION	R-VALUE	THICKNESS
ROOF	R-29	5" RIGID
WALL (CONTINUOUS)	R-5	1" RIGID
WALL (CAVITY)	R-19	6" BATT
SLAB	R-10	2" RIGID

NOTES:
1. REFER TO FLOOR PLAN AND WALL SECTION SHEETS FOR INSULATION EXTENTS AND LOCATIONS.
2. REFER TO SPECIFICATIONS FOR INSULATION PRODUCT INFORMATION.



B4 FLOOR PLAN
1/4" = 1'-0"

N NORTH

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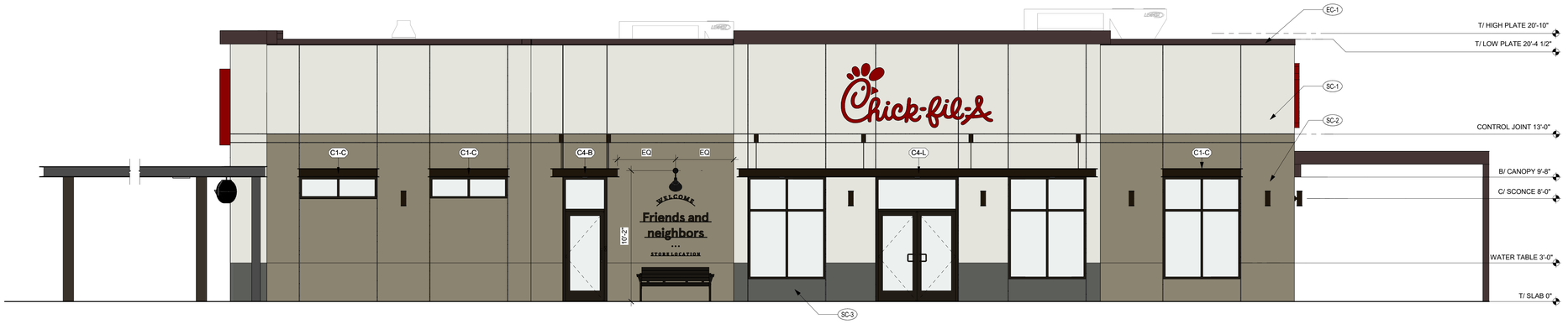
SHEET
FLOOR PLAN

SHEET NUMBER
A-201

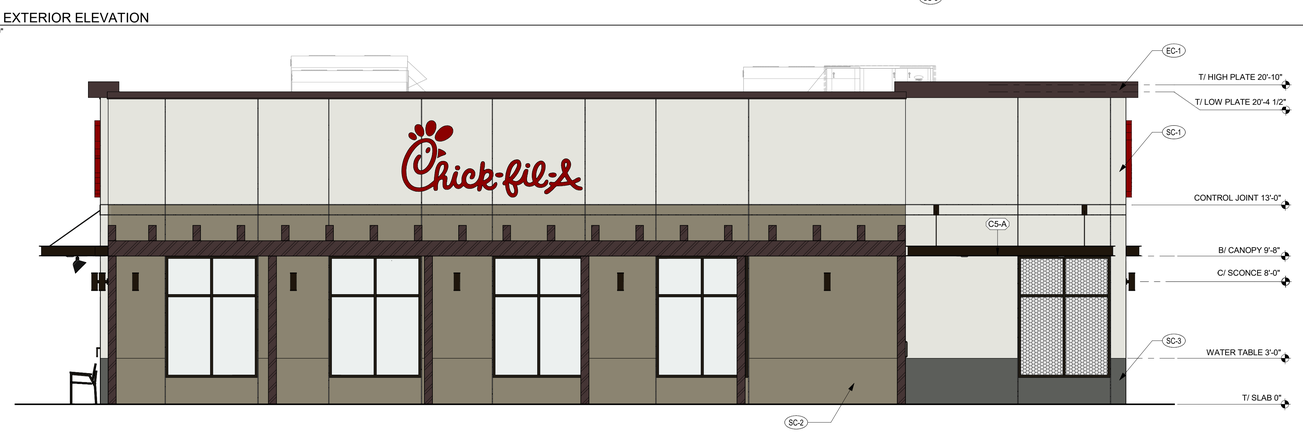
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10-SE-05889-A-201-FLOOR PLAN



D4 EAST EXTERIOR ELEVATION
1/4" = 1'-0"



C4 WEST EXTERIOR ELEVATION
1/4" = 1'-0"



B4 SOUTH EXTERIOR ELEVATION
1/4" = 1'-0"



A4 NORTH EXTERIOR ELEVATION
1/4" = 1'-0"

GENERAL NOTES
1. ALL SIGNAGE PROVIDED BY OTHERS
2. REF FLOOR PLAN AND WINDOW LEGEND FOR STOREFRONT INFORMATION

ATTACHED CANOPY SCHEDULE BN_

Mark	Description	Count	Overall Width	Overall Depth	Tie Back Mounting (Offset From Top)	Integral Lighting
C1-C	Exterior Canopy	7	6'-4"	1'-0"	0"	No
C4-B	Exterior Canopy	2	5'-4"	4'-0"	2'-4"	Yes
C4-L	Exterior Canopy	1	28'-0"	4'-0"	2'-4"	Yes
C5-A	Exterior Canopy	1	13'-8"	5'-3 1/8"	2'-4"	Yes
Grand total		11				

CANOPY NOTES:

BUILDING MOUNTED CANOPIES
- 8" THICK CANOPY
- KYNAR FINISH OF STRUCTURE, FASCIA, & DECKING TO MATCH (CP-1)

COLUMN MOUNTED CANOPIES
- 10" THICK CANOPY
- FINISH OF STRUCTURE TO BE (CP-1)
- FINISH OF DECKING TO BE (CP-2)

FINISH SCHEDULE - EXTERIOR

MARK	DESCRIPTION	MANUFACTURER	MODEL NAME	MODEL NUMBER	COLOR	NOTE
CP-1	CANOPY METAL FASCIA		DURA COAT	DC19ST-2703	DARK BRONZE	OIL RUBBED BRONZE METALLIC TEXTURE PVD
CP-2	CANOPY METAL DECK				WHITE	SMOOTH WHITE, HIGH GLOSS
EC-1	PARAPET WALL COPING	DUROLAST / EXCEPTIONAL METALS			DARK BRONZE	
PT-100	EXTERIOR PAINT	SHERWIN WILLIAMS	SHER-CRYL HIGH PERFORMANCE ACRYLIC #B66-350	SW-2807	ROOKWOOD	REFUSE ENCLOSURE. FINISH: SEMI-GLOSS ON DOOR FRAMES, SATIN ON WALLS
PT-113	EXTERIOR PAINT	SHERWIN WILLIAMS	SHER-CRYL HIGH PERFORMANCE ACRYLIC #B66-350	SW BRONZETONE	DARK BRONZE	FINISH: SEMI-GLOSS
SC-1	STUCCO	STO	POWERWALL	SW-7566	WESTHIGHLAND WHITE	FINISH: SAND MEDIUM
SC-2	STUCCO	STO	POWERWALL	SW-6172	HARDWARE	FINISH: SAND MEDIUM
SC-3	STUCCO	STO	POWERWALL	CFA CUSTOM	URBAN NIGHT	FINISH: SAND MEDIUM
ST-1	STOREFRONT	YKK	YES 45		DARK BRONZE (MATTE)	

LEGEND

- SC-1 — STUCCO SYSTEM COLOR: SW7566 - "WESTHIGHLAND WHITE" FINISH: SAND MEDIUM
- SC-2 — STUCCO SYSTEM COLOR: SW6172 - "HARDWARE" FINISH: SAND MEDIUM
- SC-3 — STUCCO SYSTEM COLOR: CUSTOM SW - "URBAN NIGHT" FINISH: SAND MEDIUM
- EC-1 — PREFINISHED METAL COPING COLOR: DARK BRONZE
- ST-1 — STOREFRONT COLOR: DARK BRONZE
- TEMPERED GLASS ONE-WAY FILM ON INSIDE FACE
- EXPANSION JOINT, SEALANT COLOR TO MATCH MORTAR COLOR, RE: SPECIFICATIONS
- CARD READER BY SECURITY VENDOR - RE: ELEC
- SCUPPER - (PT-113) SEE A2 / A-503
- DOWNSPOUT - (PT-113) SEE A3 / A-503
- MDP - (PT-113) RE: ELECTRICAL
- OIL EXTRACTION PORT ACCESS BOX
- CO2 FILL BOX - RE: KITCHEN
- LIGHT FIXTURE - RE: ELECTRICAL
- CT CABINET - (PT-113) RE: ELECTRICAL

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P 949.660.9128

CHICK-FIL-A
HWY 8 AND 4TH STREET
W BASELINE ST & N 4TH AVENUE
CORNELIUS, OREGON 97113

FSR#05889

BUILDING TYPE / SIZE: P14 SE BS
RELEASE: 24.05
PRINTED FOR
ENTITLEMENT PACKAGE

REVISION SCHEDULE

NO.	DATE	DESCRIPTION

CONSULTANT PROJECT # IRV24-0057-00
DATE 10/08/2024
DRAWN BY V.Z.

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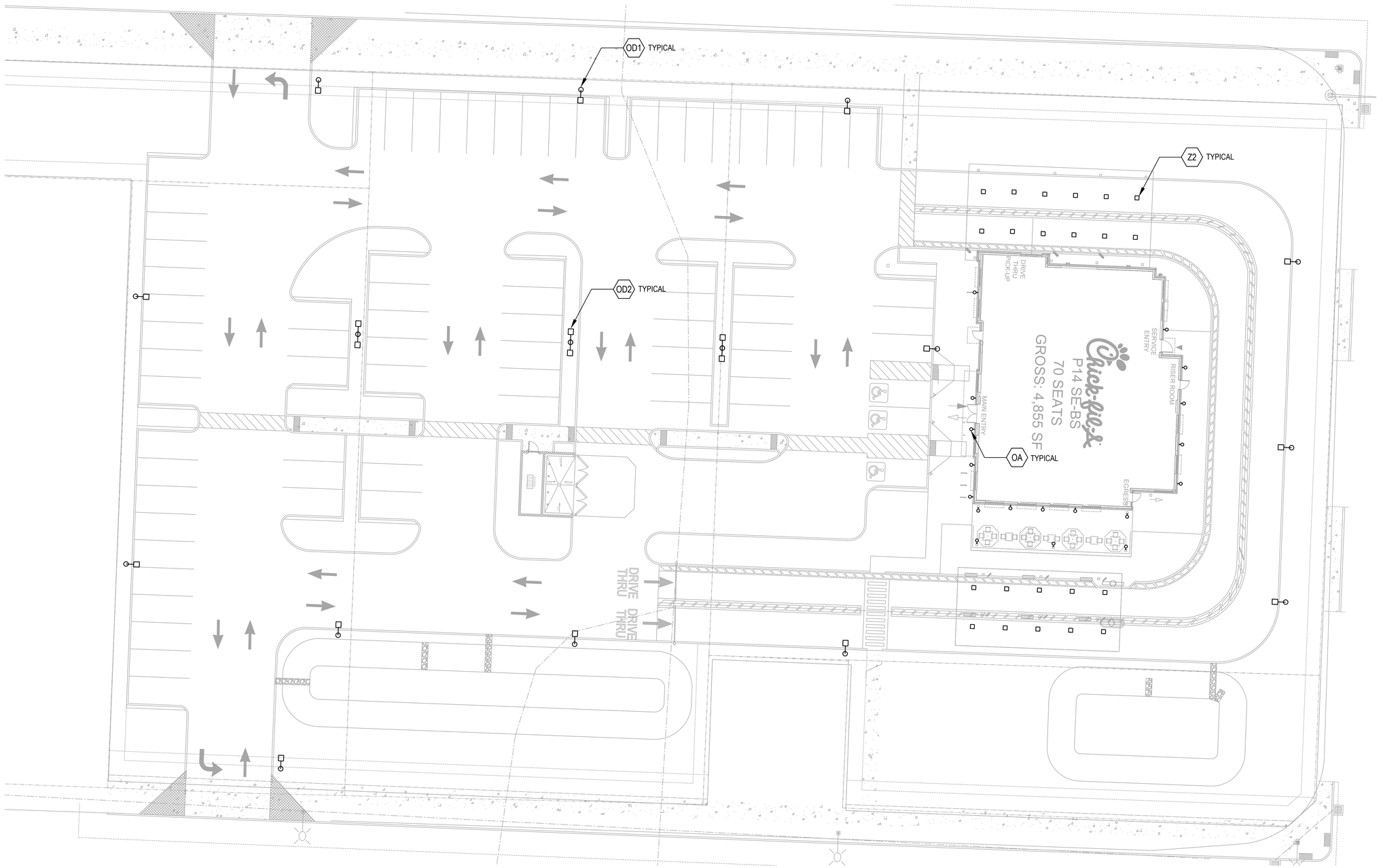
SHEET
EXTERIOR ELEVATIONS - COLOR

SHEET NUMBER
A-302

10/8/2024 5:28:40 PM Autodesk Docs://OR_05889_Hwy 8 and 4th _2024.8_FSR/05889_Hwy 8 and 4th _ARC.rvt
10-SE-05889-A-302-EXTERIOR ELEVATIONS - COLOR

SCHEDULE

SYMBOL	TAG	QTY	MANUFACTURER	CATALOG NUMBER	DESCRIPTION	FILE NAME	(QTY)LAMP	LUMENS	LLF	WATTS	DISTRIBUTION	MOUNTING HEIGHT
	OD1	13	COOPER LIGHTING	PRV-PA2B-730-U-T4W-HSS	PREVAIL AREA AND ROADWAY LUMINAIRE (2) 70 CRI, 3000K, 970mA LIGHT ENGINES WITH 24 LEDS AND TYPE IV WIDE OPTICS WITH HOUSE SIDE SHIELD	PRV-PA2B-730-U-T4W-HSS.ies	1	12,816	0.9	151.0	BUG RATING : B1-U0-G3	20'-10"
	OD2	3	COOPER LIGHTING	PRV-PA2B-730-U-T4W	PREVAIL AREA AND ROADWAY LUMINAIRE (2) 70 CRI, 3000K, 970mA LIGHT ENGINES WITH 24 LEDS AND TYPE IV WIDE OPTICS	PRV-PA2B-730-U-T4W.ies	2	35,392	0.9	302.0	BUG RATING : B3-U0-G4	20'-10"
	Z2	22	DECO LIGHTING	D533R-PRO-55-30-U-5-W-M	LED CANOPY LUMINAIRE, 3000K, 80 CRI		1	7910	0.9	55		RECESS
	OA	18	PROGRESS LIGHTING	P5675-31	5" UP/DOWN CYLINDER WITH HEAVY DUTY ALUMINUM CONSTRUCTION, WET LISTED, WITH TWO GENERAL ELECTRIC RETROFIT LAMPS #LED12P30RW83025		2		0.9	24		8'-0"



ELECTRICAL SITE LIGHTING PLAN — SCALE 1/16" = 1'-0" — 1

Chick-fil-A
5200 Buffington Road
Atlanta, Georgia
30349-2998

WARE MALCOMB
Leading Design for Commercial Real Estate

4683 Chabot Drive, Ste 300
Pleasanton, CA 94588
P 925.244.9620
F 925.244.9621

CHICK-FIL-A
W BASELINE ST & N 4TH AVENUE

W BASELINE ST & N 4TH AVENUE
CORNELIUS, OR 97113

FSR# 05889

BUILDING TYPE / SIZE:

RELEASE:

REVISION SCHEDULE

CONSULTANT PROJECT #

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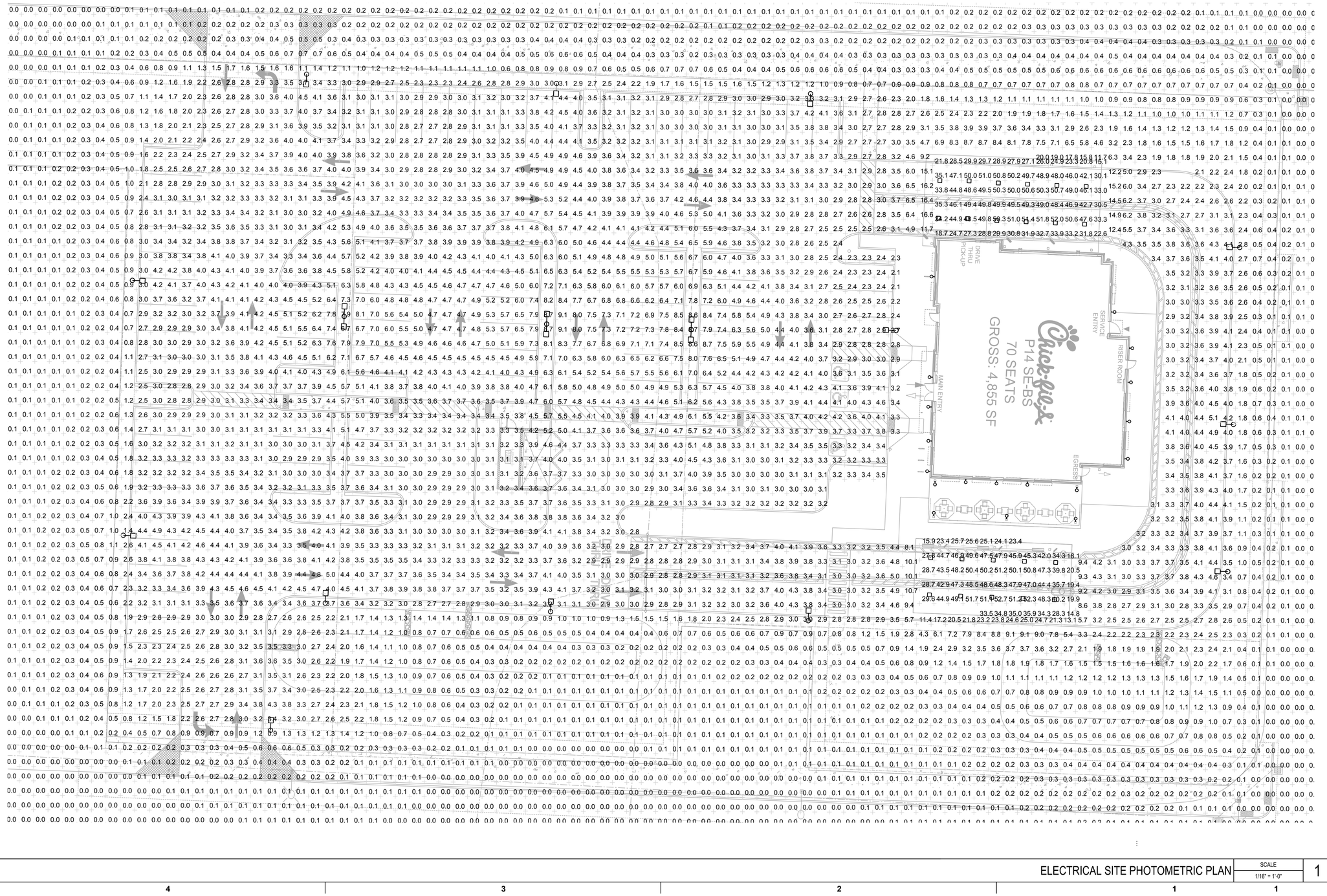
ELECTRICAL SITE LIGHTING PLAN

SHEET NUMBER

ES1.0

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Statistics						
Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
Parking/Driveway	+	4.0 fc	25.0 fc	2.0fc	12.5:1	2.0:1
Canopy (Attached)	+	39.8 fc	52.0 fc	15.1fc	3.4:1	2.6:1
Canopy (Freestanding)	+	39.0 fc	52.7 fc	14.8fc	3.6:1	2.6:1



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CHICK-FIL-A

W BASELINE ST & N 4TH AVENUE

W BASELINE ST & N 4TH AVENUE
CORNELIUS, OR 97113

FSR# 05889

BUILDING TYPE / SIZE:
RELEASE:

REVISION SCHEDULE

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SHEET
ELECTRICAL SITE PHOTOMETRIC PLAN

SHEET NUMBER
EP1.0

ELECTRICAL SITE PHOTOMETRIC PLAN | SCALE 1/16" = 1'-0" | 1

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Project		Catalog #		Type	
Prepared by		Notes		Date	



Lumark

Prevail Discrete LED

Area / Site Luminaire

Product Features

LumenSafe Technology

Product Certifications

Interactive Menu

- Ordering Information page 2
- Mounting Details page 3
- Optical Configurations page 4
- Product Specifications page 4
- Energy and Performance Data page 5
- Control Options page 7

Quick Facts

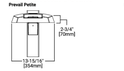
- Direct-mounted discrete light engine for improved optical uniformity and visual comfort
- Lumen packages range from 4,300 - 41,000 nominal lumens (20W - 300W)
- Replaces 70W up to 1,000W HID equivalents
- Efficacies up to 148 lumens per watt
- Standard universal quick mount arm with universal drill patterns

Connected Systems

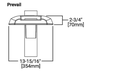
- WaveLinx

Dimensional Details

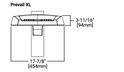
Prevail Petite

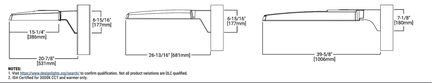


Prevail



Prevail XL





NOTES:
1. Visit https://www.designlights.org/search/ to confirm qualification. Not all product variations are DLC qualified.
2. IDA Certified for 3000K CCT and warmer only.

Lumark

Prevail Discrete LED

Ordering Information

SAMPLE NUMBER: **PRV-XL-P4AB-740-U-T4W-BZ**

Product Family [1]	Light Engine: Configuration	Light Engine: Drive Current*	Color Temperature	Voltage	Distribution	Mounting (Included)	Finish
PRV-P=Prevail Petite **PRV-P-SVOLT**=Prevail Petite SVOLT BAA Buy American Act Compliant [2] **TAA-PRV-P**=Prevail Petite TAA Trade Agreements Act Compliant [2]	**PA1**=1 Panel, 24 LED Rectangle	A=450mA Nominal B=530mA Nominal C=650mA Nominal D=1200mA Nominal	740=703CRI, 4000K 730=703CRI, 3000K 750=703CRI, 5000K	U=Universal, 120-277V H=High Voltage, 347-480V 1=347V 4=480V [3] R=Round, 277-480V [4,5]	T2R=Type II Roadway T2S=Type II Urban T3=Type III<

DECO© | LIGHTING

D533R-PRO

High Performance Recessed Canopy Light

Client: Order #:
Project Name: Type: Qty:

Performance Data

CRI
80+

CCT
3000K, 3500K, 4000K, 5000K

Projected Lifetime
175,000 Hours (L80);
91,000 Hours (L90)

Dimming
0-10V dimming standard, 100% down to 10%

Operating Temperature
-40°C to +50°C Ambient

ETL Listed
Suitable for dry, damp, wet locations



ETL Listed | 10 Yr Warranty Available | USA Buy American Act Compliant

Description

The D533R-PRO recessed canopy light is perfect as a low-power utility or apartment garage light and is well-suited for security, entry ways, and perimeter lighting. Featuring a motion sensor standard, sturdy construction and IP65 rated housing, the D533-PRO also delivers top-end performance at up to 154 lumens per watt.

Features

- Gasketed high performance PMMA optics.
- Universal voltage 120-277V standard; 347-480V Available
- Powder coated aluminum and steel housing
- Robust design for superb durability
- CRI of 80 or greater for accurate color rendering in parking applications
- Delivers up to 154 lm/W
- IP65 Rated

D533R-PRO (A) (B) (C) (D) (E) (F) (G)

Ordering Information

(A) FIXTURE SERIES

D533R-PRO	High Performance Recessed Canopy Light

(B) WATTAGE/LUMENS

35	35W/5270[1]
55	55W/7910[1]
75	75W/11550[1]

(C) CCT

30	3000K
35	3500K
40	4000K
50	5000K

(D) VOLTAGE

U	122-277V
K	347-480V

(E) DISTRIBUTION

5	Type V
4	Type IV
3	Type III

(F) FINISH

W	White
S	Silver
Z	Bronze
C	Custom

(G) OPTION

E	Emergency
M	Motion Sensor

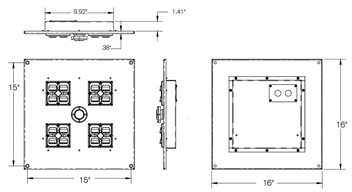
[1] Delivered Lumens

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Commerce Ca 90040
www.getdeco.com
info@getdeco.com
t: (800) 613-DECO
f: (213)265-6955
Deco Lighting practices a program of continuous product development, and as a result product specifications change frequently. We reserve the right to change product specifications without notice. Contact Deco for the latest product information.

D533R-PRO High Performance Recessed Canopy Light

"Digitize *your light.*"

Dimensions



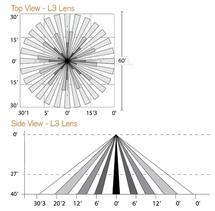
Motion Sensor



Bi-Level & Daylight Harvest PIR Sensor



- Slim, low-profile sensor is designed for installation inside the bottom of a light fixture.
- Provides multi-level control based on motion and/or daylight contribution.
- 30' range sensitivity detector.
- Works with ballasts or LED drivers.
- Adjustable light levels and stand-by time.
- Constructed out of fire retardant polycarbonate material that is UV and impact resistant.



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Commerce Ca 90040
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info@getdeco.com
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Deco Lighting practices a program of continuous product development, and as a result product specifications change frequently. We reserve the right to change product specifications without notice. Contact Deco for the latest product information.

DECO© | LIGHTING

TYPE "Z2"

PROGRESS LIGHTING™

Project:
Fixture Type:
Location:
Contact:

P5675-31

Cylinder

5" up/down cylinder/ outdoor lantern in Black. with heavy duty aluminum construction and die cast wall bracket. Powder coated finish. Wet location listed when used with P860045 top cover lens.

- Black finish.
- Powder coat finish.
- Ideal for a wide variety of interior and exterior applications.
- Die-cast aluminum wall brackets and heavy duty aluminum framing.
- Wet location listed when used with P860045 top cover lens (sold separately)

Category: Outdoor
Finish: Black (powder coat paint)
Construction: cast aluminum Construction



Width: 5 in
Height: 14 in
Depth: 7-7/8 in
H/CTR: 7 in

MOUNTING	ELECTRICAL	LAMPING	ADDITIONAL INFORMATION
Wall mounted	Prewired	Quantity: two 75 W max. PAR-30 or BR-30 or LED equivalent	cCSAus Damp Location Listed
Mounting strap for outlet box included	6 inches of wire supplied		1-year Limited Warranty
back plate covers a standard 4" recessed outlet box: 4.5" W.,	120 V	E26 base porcelain sockets	

701 Millennium Blvd. Greenville, South Carolina 29607 www.progresslighting.com Rev. 07/20

TYPE "OA"

Chick-fil-A
5200 Buffington Road
Atlanta, Georgia
30349-2998

WARE MALCOMB
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4683 Chabot Drive, Ste 300
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CHICK-FIL-A

W BASELINE ST & N 4TH AVENUE

W BASELINE ST & N 4TH AVENUE
CORNELIUS, OR 97113

FSR# 05889

BUILDING TYPE / SIZE:
RELEASE:

REVISION SCHEDULE

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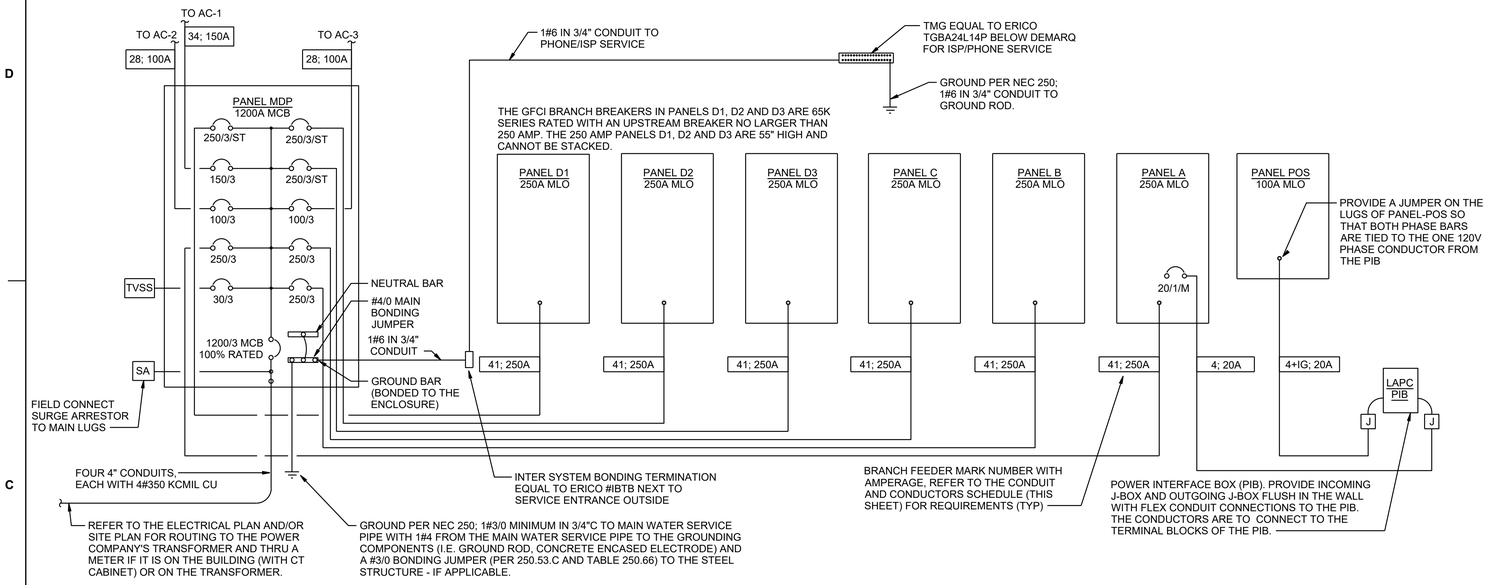
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SHEET
SITE LIGHTING CUTSHEET

SHEET NUMBER
EP1.2

SITE LIGHTING CUTSHEET | SCALE NTS | 1

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SINGLE-LINE DIAGRAM NOTES

1. VERIFY SERVICE LOCATIONS AND CONFORM TO THE REQUIREMENTS OF THE POWER COMPANY AND/OR DEVELOPER. POWER COMPANY AND/OR DEVELOPER SHALL BE CONTACTED PRIOR TO BEGINNING CONSTRUCTION TO ARRANGE AND VERIFY FOR THE INSTALLATION OF THE POWER COMPANY SERVICE, METER, AND OTHER ITEMS.
2. GROUND ALL EQUIPMENT AND SERVICES IN ACCORDANCE WITH ARTICLE 250 OF THE NATIONAL ELECTRICAL CODE, LOCAL APPLICABLE CODES, AND ALSO AS INDICATED ON DRAWINGS.
3. MAKE NECESSARY INSPECTIONS OF EXISTING SITE AND SERVICE LOCATIONS AS REQUIRED FOR THIS WORK AND MAKE ALLOWANCE FOR EXISTING CONDITIONS BEFORE SUBMITTING BID. VERIFY WORK REQUIRED WITH POWER COMPANY AND TELEPHONE COMPANY.
4. CUT AND PATCH THE CONSTRUCTION WORK AS REQUIRED FOR PROPER INSTALLATION OF THE ELECTRICAL WORK. ALL PATCHING SHALL MATCH THE SURROUNDING WORK TO THE SATISFACTION OF THE ARCHITECT. ALL CONDUIT SHALL BE INSTALLED CONCEALED UNLESS SPECIFICALLY APPROVED BY THE ARCHITECT. COORDINATE SAW CUTTING WITH LANDLORD'S OR OWNER'S REPRESENTATIVE.
5. WIRE AND CABLE:
   A. CONDUCTORS SHALL BE COPPER, #12 AWG, MINIMUM UNLESS SPECIFICALLY NOTED OTHERWISE.
   B. CONDUCTOR #10 AWG AND SMALLER SHALL BE SOLID AND #8 AWG AND LARGER SHALL BE STRANDED. INSULATION SHALL BE 600 VOLT, THHN/THWN.
6. PROVIDE ENGRAVED LAMINATED PHENOLIC BLOCK-ON-WHITE (UNLESS NOTED OTHERWISE) NAMEPLATES SECURED TO EQUIPMENT WITH ADHESIVE AND SCREWS FOR PANELBOARDS, RELAY CABINETS, TRANSFORMERS, DISTRIBUTION BOARDS, AND MAIN PANELBOARD - IDENTIFYING EQUIPMENT DESIGNATION (CORRESPONDING WITH DESIGNATION USED ON DRAWINGS) AND EQUIPMENT VOLTAGE. LETTERING SHALL BE 1/4" HIGH. PROVIDE LABELS FOR CIRCUIT BREAKERS, FUSIBLE SWITCHES AND STARTERS IN PANELBOARDS AND DISTRIBUTION BOARDS FOR EACH DEVICE IDENTIFYING EQUIPMENT CONTROLLED. LETTERING SHALL BE 1/8" HIGH.
7. ALL DEVICES SHALL HAVE AN INTERRUPTING CAPACITY NOT LESS THAN THE POWER COMPANY AVAILABLE FAULT CURRENT, OR AS INDICATED ON THE DRAWINGS.
8. 120/208 VOLT BRANCH CIRCUIT PANELBOARD BREAKERS SHALL HAVE A MINIMUM U.L. SERIES RATING OF 65 KAIC WITH UP-STREAM FEEDER BREAKERS AS NOTED.
9. AVAILABLE SPACE FOR MAIN PANELBOARD IS LIMITED. PANELBOARD MUST FIT IN ALLOCATED SPACE. COORDINATE WITH CONSTRUCTION AS REQUIRED.
10. ALL WIRING SHALL BE IN CONDUIT, E.M.T OR RIGID. FLEXIBLE CONDUIT MAY ONLY BE USED FOR FINAL CONNECTIONS AND WITH GREEN EQUIPMENT GROUNDING CONDUCTORS.

SWITCHGEAR AND CONTROL EQUIPMENT NOTES

1. PURCHASE PANELBOARDS, SURGE ARRESTOR, AND TVSS FROM AN APPROVED NATIONAL ACCOUNTS VENDOR (SEE SHEET E-902 SECTION C16440, PANELBOARDS) PROVIDING SQUARE-D EQUIPMENT. NO SUBSTITUTIONS ALLOWED.
2. PURCHASE CONTROL PANEL 'CFA-T500' FROM SUNCOAST ENVIRONMENTAL, INC. (NO SUBSTITUTIONS ALLOWED). ALL EQUIPMENT IN THE CONTROL PANEL SHALL BE INSTALLED, WIRED AND CONNECTED AT THE FACTORY, INCLUDING AUTOMATIC LIGHTING CONTROL SYSTEM, LIGHTING RELAYS, HVAC STARTERS, POWER SUPPLIES, MISCELLANEOUS RELAYS AND CONTROLS, AND THERMOSTATS.
3. CONTRACTOR SHALL PROVIDE PANEL FEEDERS A, B, C, D1, D2, D3, AND POS, BRANCH CIRCUIT CONDUIT AND WIRE, AND INSTALL ALL EQUIPMENT AS REQUIRED.
4. ALL BREAKERS AND PANELS SHALL BE SQUARE-D.
5. TVSS AND SURGE ARRESTOR UNITS SHALL BE MOUNTED DIRECTLY ADJACENT TO THE SIDE OF THE MAIN DISTRIBUTION PANEL IN NEMA 3R ENCLOSURES. CLOSE NIPPLE THE UNITS TO THE SIDE OF THE PANEL. PROVIDE CONNECTION OF TVSS UNIT TO BREAKER IN PANEL. CONNECT SURGE ARRESTOR TO MAIN INCOMING LUGS OF THE PANEL. CONNECT USING MINIMUM LENGTH OF WIRE WITHOUT SHARP BENDS IN THE WIRE AND SHALL NOT BE LENGTHENED FROM WIRE LENGTH PROVIDED WITH THE TVSS OR SURGE SUPPRESSOR DEVICE.

B1 CONDUIT AND CONDUCTORS SCHEDULE

Mark No.	OCP Device (Amp/Poles)	Conductors Total Amps 60d C	75d C	Conductors Phase & Neutral Qty	Size	Type	Min Eq Grd Qty/Set	Size	Raceway Size (Nominal Inches) No. Sets	Phase, Neutral & Equip Grd EMT	IMC	RIGID	PVC	With IG EMT	IMC	PVC
1	20/1	20	-	2	12	THHN	1	12	One	0.75	0.75	0.75	0.75	0.75	0.75	0.75
2	20/2	20	-	3	12	THHN	1	12	One	0.75	0.75	0.75	0.75	0.75	0.75	0.75
3	20/3	20	-	4	12	THHN	1	12	One	0.75	0.75	0.75	0.75	0.75	0.75	0.75
4	25/1	30	-	2	10	THHN	1	10	One	0.75	0.75	0.75	0.75	0.75	0.75	0.75
5	25/2	30	-	3	10	THHN	1	10	One	0.75	0.75	0.75	0.75	0.75	0.75	0.75
6	25/3	30	-	4	10	THHN	1	10	One	0.75	0.75	0.75	0.75	0.75	0.75	0.75
7	30/1	30	-	2	10	THHN	1	10	One	0.75	0.75	0.75	0.75	0.75	0.75	0.75
8	30/2	30	-	3	10	THHN	1	10	One	0.75	0.75	0.75	0.75	0.75	0.75	0.75
9	30/3	30	-	4	10	THHN	1	10	One	0.75	0.75	0.75	0.75	0.75	0.75	0.75
10	40/1	40	-	2	8	THHN	1	10	One	0.75	0.75	0.75	0.75	0.75	0.75	0.75
11	40/2	40	-	3	8	THHN	1	10	One	0.75	0.75	0.75	0.75	0.75	0.75	0.75
12	40/3	40	-	4	8	THHN	1	10	One	0.75	0.75	0.75	0.75	0.75	0.75	1.00
13	45/3	55	-	4	6	THHN	1	10	One	1.00	1.00	1.00	1.00	1.00	1.00	1.00
14	50/1	55	-	2	6	THHN	1	10	One	0.75	0.75	0.75	0.75	0.75	0.75	0.75
15	50/2	55	-	3	6	THHN	1	10	One	0.75	0.75	0.75	0.75	1.00	1.00	1.00
16	50/3	55	-	4	6	THHN	1	10	One	1.00	1.00	1.00	1.00	1.00	1.00	1.00
17	60/1	70	-	2	4	THW	1	8	One	1.00	1.00	1.00	1.00	1.25	1.00	1.25
18	60/2	70	-	3	4	THW	1	8	One	1.25	1.00	1.25	1.25	1.25	1.25	1.25
19	60/3	70	-	4	4	THW	1	8	One	1.25	1.25	1.25	1.25	1.25	1.25	1.25
20	70/1	70	-	2	4	THW	1	8	One	1.00	1.00	1.00	1.00	1.25	1.00	1.25
21	70/2	70	-	3	4	THW	1	8	One	1.25	1.00	1.25	1.25	1.25	1.25	1.25
22	70/3	70	-	4	4	THW	1	8	One	1.25	1.25	1.25	1.25	1.25	1.25	1.25
23	80/2	85	-	3	3	THW	1	8	One	1.25	1.25	1.25	1.25	1.25	1.25	1.25
24	80/3	85	-	4	3	THW	1	8	One	1.25	1.25	1.25	1.25	1.50	1.25	1.50
25	90/2	95	-	3	2	THW	1	8	One	1.25	1.25	1.25	1.25	1.50	1.25	1.50
26	90/3	95	-	4	2	THW	1	8	One	1.50	1.25	1.50	1.50	1.50	1.50	1.50
27	100/2	110	-	3	1	THW	1	6	One	1.50	1.50	1.50	1.50	2.00	2.00	2.00
28	100/3	110	-	4	1	THW	1	6	One	2.00	2.00	2.00	2.00	2.00	2.00	2.00
29	110/2	-	150	3	1/0	THW	1	6	One	1.25	1.25	1.25	1.25	1.50	1.25	1.50
30	110/3	-	150	4	1/0	THW	1	6	One	1.50	1.25	1.50	1.50	1.50	1.50	1.50
31	125/2	-	150	3	1/0	THW	1	6	One	1.50	1.50	1.50	1.50	2.00	2.00	2.00
32	125/3	-	150	4	1/0	THW	1	6	One	2.00	2.00	2.00	2.00	2.00	2.00	2.00
33	150/2	-	150	3	1/0	THW	1	6	One	2.00	1.50	2.00	2.00	2.00	2.00	2.00
34	150/3	-	150	4	1/0	THW	1	6	One	2.00	2.00	2.00	2.00	2.00	2.00	2.00
35	175/2	-	175	3	2/0	THW	1	6	One	2.00	2.00	2.00	2.00	2.00	2.00	2.00
36	175/3	-	175	4	2/0	THW	1	6	One	2.00	2.00	2.00	2.00	2.50	2.50	2.50
37	200/2	-	200	3	3/0	THW	1	6	One	2.00	2.00	2.00	2.00	2.50	2.50	2.50
38	200/3	-	200	4	3/0	THW	1	6	One	2.50	2.50	2.50	2.50	2.50	2.50	2.50
39	225/2	-	230	3	4/0	THW	1	4	One	2.50	2.00	2.50	2.50	2.50	2.50	2.50
40	225/3	-	230	4	4/0	THW	1	4	One	2.50	2.50	2.50	2.50	2.50	3.00	3.00
41	250/3	-	255	4	250	THW	1	4	One	2.50	3.00	3.00	3.00	3.00	3.00	3.00
42A	300/3	-	285	4	300	THW	1	4	One	3.00	3.00	3.00	3.00	3.00	3.00	3.00
42B	300/3	-	310	4	350	THW	1	4	One	3.00	3.00	3.00	3.00	3.00	3..00	3.00
43A	350/3	-	335	4	400	THW	1	4	One	3.00	3.50	3.50	3.50	3.50	3.50	3.50
43B	350/3	-	380	4	500	THW	1	4	One	3.50	3.50	3.50	3.50	3.50	3.50	3.50
44A	400/3	-	380	4	500	THW	1	3	One	3.50	3.50	3.50	3.50	3.50	3.50	3.50
44B	400/3	-	400	4	3/0	THW	1	3	Two	2.50	2.50	2.50	2.50	2.50	2.50	2.50
45A	600/3	-	570	4	300	THW	1	1	Two	3.00	3.00	3.00	3.00	3.00	3.00	3.00
45B	600/3	-	620	4	350	THW	1	1	Two	3.00	3.00	3.00	3.00	3.00	3.00	3.50
46A	800/3	-	760	4	500	THW	1	1/0	Two	3.50	3.50	3.50	3.50	3.50	3.50	3.50
46B	800/3	-	820	4	600	THW	1	1/0	Two	4.00	4.00	4.00	4.00	4.00	4.00	4.00
47	1000/3	-	1005	4	400	THW	1	2/0	Three	3.50	3.50	3.50	3.50	3.50	3.50	3.50
48	1200/3	-	1240	4	350	THW	1	3/0	Four	3.50	3.50	3.50	3.50	3.50	3.50	4.00
49	1600/3	-	1675	4	400	THW	1	4/0	Five	4.00	4.00	4.00	4.00	4.00	4.00	4.00

Notes:
Conductors are rated at 600 volt or below and are to be copper.

NEC Table 310.15(B)(16) - formerly Table 310.16 - is used for the basis of the conductor ampacities, which is not more than three current carrying conductors in a raceway at an ambient temperature of 30 deg C with 60 deg C rated conductors and connectors per 110.14-C-1 for up to 100 amp rated and up to #1 AWG conductors for equipment terminations and 75 deg C rated conductors and termination connectors for larger than 100 amp or above #1 AWG conductors.

NEC Tables 4, 5, and Appendix C is used for the basis of the conduit sizes. Table C1 for EMT, Table C4 for IMC, Table C8 for Rigid, and Table C10 for PVC (Sch 40).

All Branch Feeders and Branch Circuits shall include a green Equipment Grounding Conductor.

Omit Grounding conductor on Service Entrance Feeders.

Omit Neutral conductor on all Delta primary transformer feeders or single-phase 2 pole loads and 3 phase loads not requiring a neutral.

The above conductors are not calculated for Voltage Drop. Any circuits that exceed 100 feet shall be calculated by the Installer to have less than a three percent voltage drop on feeders and five percent on branch circuits per the NEC.

SINGLE LINE DIAGRAM | SCALE NTS | 1

CONDUIT AND CONDUCTOR SCHEDULE | SCALE NTS | 2

Chick-fil-A
5200 Buffington Road
Atlanta, Georgia
30349-2998

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Leading Design for Commercial Real Estate
4683 Chabot Drive, Ste 300
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CHICK-FIL-A
W BASELINE ST & N 4TH AVENUE
W BASELINE ST & N 4TH AVENUE
CORNELIUS, OR 97113

FSR# 05889

BUILDING TYPE / SIZE:
RELEASE:

REVISION SCHEDULE

CONSULTANT PROJECT #
PRINTED FOR
DATE
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SHEET
SINGLE LINE DIAGRAM

SHEET NUMBER
E5.0

D:\Acies Engineering\ACIES Project\Chick-Fil-A\Hwy 8 and 4th\Electrical\24.1009_E1.1.dwg Sheet No: E5.0 Saved by: anjo - Monday, August 26, 2024 2:03 PM Printed by: Anjo Santos - August 26, 2024 2:03 PM

CHICK-FIL-A HWY 8 AND 4TH STREET

CONCEPTUAL DESIGN

W BASELINE ST & N 4TH AVENUE
CORNELIUS, OREGON 97113

IRV24-0057-00
AUGUST 28, 2024

DISCLAIMER: THIS CONCEPTUAL DESIGN IS BASED UPON A PRELIMINARY REVIEW OF ENTITLEMENT REQUIREMENTS AND ON UNVERIFIED AND POSSIBLY INCOMPLETE SITE AND/OR BUILDING INFORMATION, AND IS INTENDED MERELY TO ASSIST IN EXPLORING HOW THE PROJECT MIGHT BE DEVELOPED. SIGNAGE SHOWN IS FOR ILLUSTRATIVE PURPOSES ONLY AND DOES NOT NECESSARILY REFLECT MUNICIPAL CODE COMPLIANCE.

WARE MALCOMB

SC-1 SW 7566 WESTHIGHLAND WHITE
STUCCO SYSTEM (SC-1)



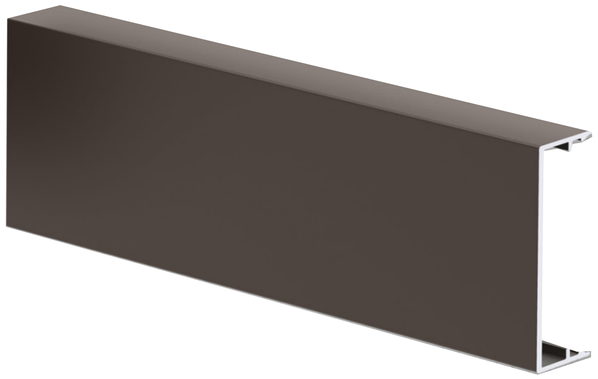
SC-2 SW 6172 HARDWARE
STUCCO SYSTEM (SC-2)



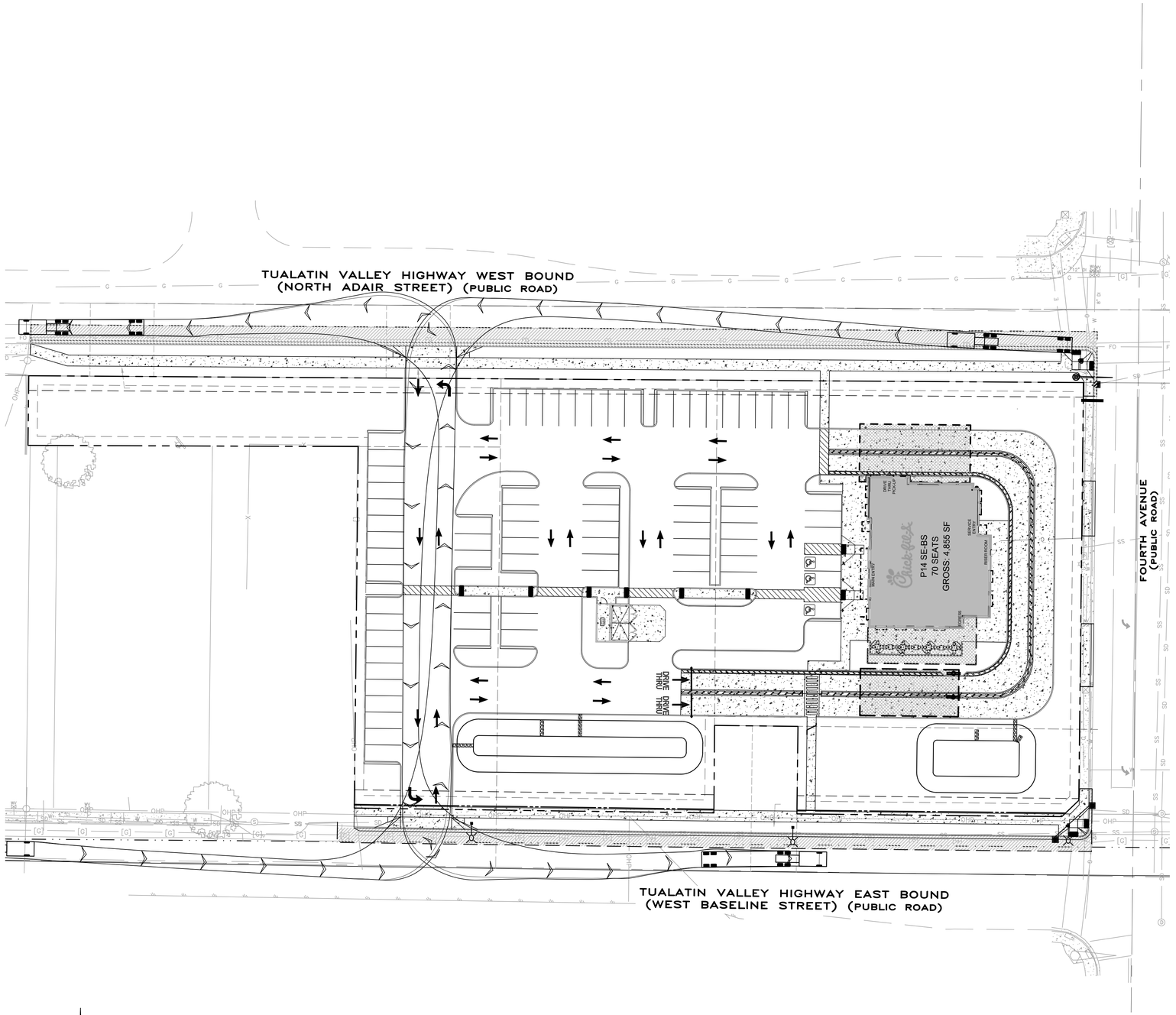
SC-3 SW CFA CUSTOM "URBAN NIGHT"
STUCCO SYSTEM (SC-3)



CP-1 SW "DARK BRONZE"
CANOPY METAL PAINT (CP-1) (EC-1)

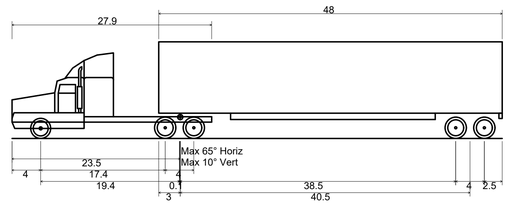


ST-1 YKK YES 45 - DARK BRONZE (MATTE)
STORE FRONT



LEGEND

- PARKING STRIPES
- ROAD STRIPING
- EXISTING FLOW LINE CURB
- EXISTING TOP OF CURB
- EDGE OF PAVEMENT
- EDGE OF CONCRETE
- PROPOSED STANDARD CURB
- W — WATER
- SD — STORM SEWER
- G — GAS
- E — ELECTRIC
- SS — SANITARY SEWER
- CENTERLINE
- RIGHT OF WAY BOUNDARY LINE
- PROPOSED PROPERTY LINE
- EASEMENT
- LOT/PARCEL LINE
- SAW CUT LINE
- PROPOSED CONCRETE
- PROPOSED LANDSCAPING
- PROPOSED ASPHALT RESTORATION
- SIGN
- TREE - DECIDUOUS
- PUBLIC SIGNAL
- STORM CATCH BASIN
- FIRE HYDRANT



Copy of WB-62 - CFA

Overall Length	68.500ft
Overall Width	8.500ft
Overall Body Height	13.500ft
Min Body Ground Clearance	1.393ft
Max Track Width	8.500ft
Lock-to-lock time	6.00s
Max Steering Angle (Virtual)	28.40°

DELIVERIES TO BE MADE
DURING NON-BUSINESS HOURS

N

30 0 30
SCALE IN FEET

Chick-fil-A
5200 Buffington Road
Atlanta, Georgia
30349-2998

DOWL
309 SW 6TH AVENUE, #700
Portland, Oregon 97204
971-280-8641

REGISTERED PROFESSIONAL ENGINEER
82613 PE
OREGON
JUN. 16, 2010
MICHAEL D. TOWLE
REVIEW ONLY
EXPIRATION DATE: 06/30/26

CHICK-FIL-A
HWY 8 & 4TH AVE
CORNELIUS, OREGON

FSR# 05889

REVISION SCHEDULE

NO.	DATE	DESCRIPTION

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SHEET
TRUCK TURNING

SHEET NUMBER
1 OF 1

DESIGN REVIEW

C:\dowl_pw\d0417500\truck.dwg PLOT DATE 2024-9-10 07:59 SAVED DATE 2024-09-10 07:58 USER: rrussell

PRELIMINARY DRAINAGE REPORT

25 N 4th Ave, Cornelius, OR 97060

2380.16076.01

Prepared by:

DOWL

309 SW 6th Ave, Suite 700
Portland, OR 97204

September 2024

Prepared for:

Chick-Fil-A
105 Progress
Irvine, CA 92618

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Appendix E: Water Quality Calcs
Appendix F: Geotechnical Report

1.0 PROJECT OVERVIEW

1.1 Project Location & Description

The proposed project is located at 25 N 4th Ave, in Cornelius, Oregon 97060 (see Figure 1 for Vicinity Map). The existing site is made up of five tax lots (2400, 2500, 2600, 2700, & 3000). The existing site includes several residences on tax lots 2400, 2600, & 2700. The proposed project improvements include a consolidation of these tax lots, a new drive-thru restaurant with parking areas, accessible paths, landscaping areas, and utility improvements.

The purpose of this report is to present stormwater best management practices (BMP) for conveyance, hydromodification, and water quality treatment to be installed as part of the project. This report demonstrated that the proposed design meets or exceeds the minimum requirements of both the ODOT Hydraulics Manual (Chapter 12 & Chapter 14) and Clean Water Services (CWS) Standards per CWS R&O 19-5 as amended by R&O 19-22. Table 1-1 below summarizes the requirements outlined by CWS. To provide clarity, the site improvements on private property will be referred to as “onsite” improvements, while the improvements within the public right-of-way will be referred to as “offsite” improvements. The onsite and offsite improvements will be analyzed as separate projects, since each of their stormwater contributions will be routed differently.

1.2 Regulatory Requirements

1.2.1 Stormwater Management Requirements

***Table 1-1**: Stormwater Management Design Standards*

Design Criteria	Jurisdictional Requirement
	CWS
Conveyance	25-yr
Water Quality	0.36 in / 4 hr
Water Quantity (Pre-Developed)[1]	2-yr, 5-yr, 10-yr
Water Quantity (Post-Developed)[2]	50% of 2-yr, 10-yr, 25-yr

[1] ‘Pre-Developed’ represents the natural condition.
[2] Water quantity events listed represent the post-developed peak runoff rates that must be detained to be less than or equal to the rates generated in pre-developed condition at the same recurrence interval.

As shown in the table above, the controlling standard will be CWS for conveyance, water quality, and detention (water quantity). However, it should be noted that the facilities within the public right-of-way must be constructed to ODOT standards.

1.2.2 ODOT Stormwater Requirements

The proposed project will include frontage improvements along N Adair Street and W Baseline Street, both of which are ODOT roadways. Per Section 12.5.1 of the ODOT Hydraulics Manual, detention will likely be required when any one of the following criteria are met:

a) Detention is required by the local jurisdiction.

b) There is a history of drainage deficiencies in the area.

c) Discharge into an intermittent or perennial water body with an upstream drainage basin that is less than 100 mi^2 (measured upstream from the project's point of discharge into the receiving water).

d) The uncontrolled peak post-construction runoff rate during the design storm is 0.5 cubic feet per second or greater.

e) Increase net impervious area within the project area by 0.25 acre or greater.

For the proposed frontage improvements, none of the above conditions are met, and therefore the project is not required to meet detention requirements. Refer to Table 2-2 for the pre- and post-developed basin areas and Table 3-1 for the impervious area table.

1.2.3 Hydromodification Assessment

Per Section 4.03 of the CWS R&O 19-5, "projects which create and/or modify 1,000 square feet or more of impervious surface, or increase the amount or rate of surface water leaving a site, are required to implement or fund techniques to reduce impacts to the downstream receiving water body." The proposed project will create more than 1,000 sf of impervious area, and therefore must perform a hydromodification assessment. The hydromodification assessment for the onsite improvements is shown below in Table 1-2. Refer to Table 1-3 for the offsite improvement hydromodification assessment.

***Table 1-2**: CWS R&O 19-5 Onsite Hydromod. Assessment*

Hydromodification Parameter	Assessment Result
Risk Level	Low
Development Class	Developed Area
Project Size	Medium (12,000 – 80,000 sf new/modified impervious area)
Project Category	Category 2
Hydromodification Requirement	Peak-Flow Matching Detention, using criteria described in Section 4.08.6
Treatment Area	Area = New Imp. + 3(Modified Imp.)
Treatment Storm	0.36 inches of precipitation falling in 4 hours with an average storm return period of 96 hours
Detention	Match pre-developed discharge rates for one-half the 2-year to the 10-year flow event
Conveyance	25-year; 24-hour SBUH Method

Table 1-3: CWS R&O 19-5 Offsite Hydromod. Assessment

Hydromodification Parameter	Assessment Result
Risk Level	Low
Development Class	Developed Area
Project Size	Small (1,000 – 12,000 sf new/modified impervious area)
Project Category	Category 1
Hydromodification Requirement	Payment of a Hydromodification Fee-In-Lieu in accordance with District Rates and Charges
Treatment Area	Area = New Imp. + 3(Modified Imp.)
Treatment Storm	0.36 inches of precipitation falling in 4 hours with an average storm return period of 96 hours
Detention	N/A
Conveyance	25-year; 24-hour SBUH Method

Table 1-4: Precipitation Frequency Estimates

Recurrence Interval	Total 24-Hour Precipitation Depth
2-year	2.50
5-year	3.10
10-year	3.45
25-year	3.90

2.0 BASIN CHARACTERISTICS

2.1 Existing Conditions

The existing conditions of the project site consist of several single-family residences. Existing grades vary throughout the site, with a high point of 179.00 at the north side of the site along North Adair Street, and a low point of 175.00 at the south side of the site along West Baseline Street. Existing stormwater runoff on-site is routed to one of the two roadside ditches on either side of the site. From the roadside ditch along North Adair Street, stormwater flows west, where it is picked up with an area drain at the west end of the ditch and routed into the public system, which continues west and then south. On the south side of the site along West Baseline Street, the roadside conveyance ditch flows west, and is routed into the existing system at a point beyond the project limits. Existing runoff on-site can be separated into four separate basins, which are shown in Figure 2 of **Appendix A**.

Basin A includes 0.832 acres of pervious areas as well as 0.308 acres of impervious asphalt and roof areas. Basin A runoff generally flows southwest and makes its way into the roadside ditch along West Baseline Street.

Basin B includes 0.818 acres of pervious areas as well as 0.136 acres of impervious asphalt and roof areas. Basin B runoff generally flows south and makes its way into the roadside ditch along West Baseline Street.

Basin C includes 0.469 acres of pervious areas as well as 0.081 acres of impervious asphalt area. Basin C runoff generally flows west and makes its way into the roadside ditch along North Adair Street.

Basin D includes 0.137 acres of pervious areas as well as 0.061 acres of impervious asphalt area. Basin D runoff generally flows southwest and makes its way into the roadside ditch along West Baseline Street.

2.2 Soil Characteristics

The Natural Resource Conservation Service (NCRS) Soil Survey identifies the existing soils onsite as silty loams and are classified as Hydrologic Soil Group C/D. Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms. For the proposed site, soil type B was used to analyze the runoff potential. See **Appendix B** for Soil Survey information. The assumed runoff curve numbers for this report are shown in Table 2-1 below.

***Table 2-1**: Assumed Runoff Curve Numbers*

Condition	Curve Number
Proposed Impervious Area	98
Existing Impervious Areas (Modified)[1]	75
Existing Impervious Areas	98
Existing Pervious Areas/Grass (Fair Condition)	79
Proposed Pervious Areas/Landscaping (Good Condition)	74

[1]Per CWS R&O 19-5 section 4.08.6.d, if a proposed project includes modified impervious surface (redevelopment), a curve number of 75 shall be used as the pre-developed condition for all modified impervious surfaces.

2.3 Proposed Conditions

The proposed site improvements include a new drive-thru restaurant and associated parking areas, concrete walks, landscaping areas, and utility improvements. The project also includes frontage improvements along North Adair Street and West Baseline Street which include concrete curb and gutter, commercial driveways, landscaping strip, sidewalk, and street trees. The project improvements along 4th Avenue are limited to the installation of street trees.

Basin A includes 1.14 acres of new asphalt pavement, concrete sidewalks and drive aisles, landscape areas, and utility improvements.

Basin B includes 0.954 acres of new asphalt pavement, concrete sidewalks and drive aisles, landscape areas, and utility improvements.

Basin C includes 0.550 acres of asphalt pavement and roadway improvements, concrete sidewalks and driveways, landscape areas, and stormwater improvements.

Basin D includes 0.199 acres of asphalt pavement and roadway improvements, concrete sidewalks and driveways, landscape areas, and stormwater improvements.

Refer to Table 2-2 for pre-developed and post-developed basin areas.

***Table 2-2**: Impervious & Pervious Basin Areas*

Basin	Pre-Development			Post-Development		
	Pervious Area (acres)	Impervious Area (acres)	Total Area (acres)	Pervious Area (acres)	Impervious Area (acres)	Total Area (acres)
A	0.832	0.308	1.140	0.309	0.831	1.140
B	0.818	0.136	0.954	0.377	0.577	0.954
C	0.469	0.081	0.550	0.317	0.233	0.550
D	0.137	0.061	0.199	0.052	0.147	0.199

3.0 STORMWATER MANAGEMENT

Per section 4.04.1 of the CWS R&O 19-5, new development and other activities which create or modify 1,000 square feet or greater of impervious surfaces or increase the amount of stormwater runoff or pollution leaving the site, are required to implement or fund pavement water quality approaches to reduce contaminants entering the storm and surface water system.

3.1 Onsite Water Quality

CWS treatment requirements and standards will be met by treatment and detention of all onsite runoff with the use of two extended dry basins, located on the south side of the site (refer to Figure 3 for Post-Developed Basin Map). Per section 4.07.1, pretreatment shall be provided by a water quality manhole upstream of each of the proposed facilities. Basins C & D will be required to meet water quality treatment standards outlined by ODOT & CWS. Refer to Section 3.3 for all ODOT Water Quality requirements.

CWS water quality approach requires the treatment of a storm event totaling 0.36 inches of precipitation falling in 4 hours. Proposed water quality flows are outlined in Table 3-1 below. Refer to **Appendix E** for water quality basin maps, water quality storm calculations, and water quality hydrographs.

Per section 4.08.1.d of the CWS R&O, all new impervious surfaces and three times the modified impervious surface, up to the total existing impervious surface on the site. The area requiring treatment is shown in Table 3-1 below and is based on the following equation:

$$CWS\ WQ\ Area\ (sf) = New\ Imp.\ +\ 3(Modified\ Imp.)$$

$$CWS\ Water\ Quality\ Volume\ (cf) = \frac{0.36\ in * Area\ (sf)}{12\ in/ft}$$

The water quality area and volume were determined for CWS water quality flow and orifice calculations only. Water quality flow was determined based on Santa-Barbara Urban Hydrology method for all proposed and contributing areas. The CWS water quality design flow anticipated from the water quality design storm is based on the following formula and is also shown below in Table 3-1.

$$Q\ (cfs) = \frac{WQV(cf)}{(14{,}400)}$$

The calculated orifice diameter applies only to the design of extended dry basins on site. Per section 4.09.5.b of the CWS R&O 19-5, extended dry basins shall be designed with an orifice sized for the water quality event using the following equation:

$$\mathrm{D} = 24 * [(\mathrm{Q}/(\mathrm{C}[2\mathrm{gH}]^{0.5}))/\pi]^{0.5}$$

The above equation represents the ideal orifice size for the water quality event, which was calculated to be 2.4" for Facility A, and 1.1" for Facility B (refer to Table 3-1 below).

***Table 3-1**: Water Quality Area & Treatment Volume*

Basin	New Impervious Area (ac)	Modified Impervious Area (ac)	CWS Water Quality Area (ac)	CWS Water Quality Volume (cf)	CWS Water Quality Flow (cfs)	Calculated Orifice Diameter (in)	Proposed WQ Treatment Method
A	0.523	0.308	1.448	1,892	0.131	2.4	Extended Dry Basin
B	0.441	0.136	0.849	1,109	0.077	1.1	Extended Dry Basin

3.1.1 Pretreatment

Per section 4.09.10.c.1, pretreatment shall be provided for the two extended dry basins with the use of a water quality manhole upstream of the outfall into the facility.

3.2 Onsite Hydromodification Assessment

A CWS hydromodification has been conducted for the onsite improvements per CWS R&O section 4.03.3 (refer to Table 1-2 for details). Following the point of discharge to the receiving reach determines the site is located within the Tualatin River reach. This basin is considered to be a "low risk" area. The development class lists the site within a "developed area". The total project impervious area (including new and modified impervious areas) is between 12,000 and 80,000 sf, which classifies the project as a "medium" size project. Therefore, per Table 4-2 within CWS DCS 4.03.5, the project is classified as a Category 2 hydromodification.

Projects within Category 2 represent those with a moderate anticipated hydromodification risk. Per CWS DCS section 4.03.5.b, any of the following approaches may be used to address hydromodification:

1. Infiltration facility, using the Standard Sizing, described in Section 4.08.5; or
2. Peak-Flow Matching Detention, using design criteria described in Section 4.08.6
3. Combination of infiltration facility and Peak-Flow Matching Detention, using criteria described in Section 4.08.5 and 4.08.6; or
4. Any option listed in Category 3

3.2.1 Peak-Flow Matching Detention

For the proposed project, the Santa-Barbara Hydrograph Peak-Flow Matching Detention approach (Option #2) was used to size the proposed stormwater facilities. Detention shall comply with CWS requirements, summarized below in Table 3-2.

***Table 3-2**: CWS Table 4-7*

Pre-Development Peak Runoff Rate	Post-Development Peak Runoff Rate Target
2-year, 24-hour	50% of 2-year, 24-hour
5-year, 24-hour	5-year, 24-hour
10-year, 24-hour	10-year, 24-hour

CWS standards require that the proposed discharge for the 2-year, 24-hour storm be detained and reduced to 50% of the pre-developed discharge rate. CWS also requires that the post-development runoff rates from the site do not exceed the pre-developed runoff rates for the 5-year and 10-year storm events for peak flow matching. Refer to **Appendix C** for all onsite pre- and post-developed runoff hydrographs.

Basin A runoff will be detained with the use of a new 799 sf (bottom area) and 3.0 ft deep extended dry basin. The extended dry basin is designed per CWS R&O section 4.09.5. The proposed bottom of the extended dry basin is set at elevation 173.00 and will discharge at the east end of the facility, where it will be routed east and connect into the existing downstream system. Flow within the facility will be managed by a dual ditch inlet structure per CWS standards. The dual inlet structure includes a flow control structure with a 2.4” water quality orifice at elevation 173.00 and a secondary detention orifice set at elevation 174.50, as well as a 12” overflow riser at elevation 175.00. The first ditch inlet structure grate elevation is set at elevation 173.50, just above the water quality storm event, to allow for full treatment of the water quality storm. The second grate is set at the maximum water surface elevation (174.80), to ensure larger storms such as the 25-year event do not overtop the pond.

Basin B runoff will be detained with the use of a new 925 sf (bottom area) and 3.0 ft deep extended dry basin. The extended dry basin is designed per CWS R&O section 4.09.5. The proposed bottom of the extended dry basin is set at elevation 172.50 and will discharge at the east end of the facility, where it will be routed east and connect into the existing downstream system. Flow within the facility will be managed by a dual ditch inlet structure per CWS standards. The dual inlet structure includes a flow control structure with a 1.1” water quality orifice at elevation 172.50 and a secondary detention orifice set at elevation 173.50, as well as a 12” overflow riser at elevation 174.50. The first ditch inlet structure grate elevation is set at elevation 173.25, just above the water quality storm event, to allow for full treatment of the water quality storm. The second grate is set at the maximum water surface elevation (174.50), to ensure larger storms such as the 25-year event do not overtop the pond.

***Table 3-3**: Onsite Pre-Development & Post-Development Runoff Rates*

Basin	Design Storm Events	Pre-Developed Flow (cfs)	Post-Developed Targets (cfs)	Post-Developed Flow (cfs)	Detained Release Flow Rate (cfs)
A	2-year, 24-hour	0.303	0.152	0.489	**0.152**
	5-year, 24-hour	0.437	0.437	0.635	**0.182**
	10-year, 24-hour	0.519	0.519	0.722	**0.248**
B	2-year, 24-hour	0.208	0.104	0.361	**0.100**
	5-year, 24-hour	0.317	0.317	0.479	**0.136**
	10-year, 24-hour	0.385	0.385	0.550	**0.154**

3.2.2 Facility Access

The proposed facilities are private facilities, and therefore each facility and all associated storm structures will be privately maintained per section 4.07.7.d of the CWS R&O and will include a Private Stormwater Facility Agreement per section 2.08.2. This agreement will be completed with final review and approval of the plans by CWS.

3.3 Offsite Water Quality

The offsite improvements will be subject to ODOT Water Quality requirements. Per Section 14.5.1 of the ODOT Hydraulics Manual, projects that include the following "trigger" elements are required to provide treatment of highway runoff:

- Producing new impervious surface area. Does not include:
    - Minor actions such as constructing signs or signal post pads, etc., or
    - Non-pollutant generating areas such as detached bike paths and detached sidewalks.
- Changing the total Contributing Impervious Area. In situations where the CIA is decreased, there may be a possibility for "banking" of treatment provided.
- Re-constructing a roadway from the subgrade. Does not include pavement overlays or inlays, nor spot reconstruction.
- Changing the type, location, direction, length, or endpoint of the pre-project stormwater conveyance system.
- Replacing or widen a stream crossing structure including adding new bridge decks or retrofitting bridge deck drainage.
- Requiring a Clean Water Act Section 404 permit and actively involving modification of impervious surfaces.

The proposed offsite improvements meet the criteria of triggers 1,2, and 3 and therefore will be required to provide water quality treatment. Per Figure 14-4 of the ODOT Hydraulics manual, the project will need to provide treatment for the entirety of the contributing impervious area, from the crown of the road to the proposed curb line.

3.3.1 Offsite Water Quality Approach

Per Section 4.04.2 of the CWS R&O, a water quality approach shall be implemented on-site unless, in the judgement of the district or City, any of the following conditions exist:

1. Due to topography, soils, or other site conditions, implementation of an on-site approach is impractical, ineffective, or results in the inefficient use of District or City resources for long-term operations and maintenances; or
2. There is a more efficient and effective regional approach within the subbasin that was designed to incorporate the development, or there is an approach in the subbasin which is demonstrated to have the capacity to treat the site.

Preliminary conversations with the City of Cornelius have revealed that the city sees any sort of LIDA water quality approach along the frontage of the project to be impractical, ineffective, and an inefficient use of City resources to maintain water quality facilities. Therefore, the project will opt to pay a Fee-In-Lieu in accordance with District Rates and Charges to satisfy the water quality requirement. It should be noted that per Figure 14-4 of the ODOT Hydraulics Manual, the

project must consider the entire contributing impervious area (CIA) to be included as area for the fee-in-lieu payment. Refer to **Appendix E** for all water quality calculations and figures.

3.4 Offsite Hydromodification Assessment

A CWS hydromodification has been conducted for the offsite improvements per CWS R&O section 4.03.3 (refer to Table 1-3 for details). Following the point of discharge to the receiving reach determines the site is located within the Tualatin River reach. This basin is considered to be a “low risk” area. The development class lists the site within a “developed area”. The total project impervious area (including new and modified impervious areas) is less than 12,000 sf, which classifies the project as a “small” size project. Therefore, per Table 4-2 within CWS DCS 4.03.5, the project is classified as a Category 1 hydromodification.

Projects within Category 1 represent those with the lowest anticipated hydromodification risk. Per CWS DCS section 4.03.5.b, any of the following approaches may be used to address hydromodification:

1. Infiltration facility, using the Simplified Sizing, as described in Section 4.08.5; or
2. Payment of a hydromodification Fee-In-Lieu in accordance with District Rates and Charges; or
3. Any option listed in Category 2 or 3.

The project proposes to use option 2 (Fee-In-Lieu) to address hydromodification for the offsite improvements.

***Table 3-4**: Pre-Development & Post-Development Runoff Rates*

Basin	Design Storm Events	Pre-Developed Flow (cfs)	Post-Developed Targets (cfs)	Post-Developed Flow (cfs)
C	2-year, 24-hour	0.121	0.061	0.159
	5-year, 24-hour	0.184	0.184	0.222
	10-year, 24-hour	0.223	0.223	0.260
D	2-year, 24-hour	0.056	0.028	0.089
	5-year, 24-hour	0.080	0.080	0.115
	10-year, 24-hour	0.095	0.095	0.130

3.4.1 ODOT Detention Requirements

Per Table 3-4 above, the proposed offsite improvements do not increase the uncontrolled (undetained) post-construction runoff rate more than 0.50 cfs during the design storm, nor does the project create more than 0.25 acres of net impervious area, and therefore the project does not trigger detention requirements.

3.5 Conveyance

The pipe conveyance system was sized and/or analyzed using the un-detained 25-year SBUH method per CWS standards and conveyance design requirements. Table 3-5 below highlights the proposed stormwater system is adequately sized for the 25-year storm.

Table 3-5: Pipe Conveyance Capacity Analysis

Pipe	Basin	[1]25-yr Runoff (cfs)	Pipe Diameter (in)	Pipe Slope (%)	Pipe Capacity (cfs)
1	A	0.836	12	**1.00**	**3.84**
2	B	0.644	12	**1.00**	**3.84**
3	A, B	1.480	12	**0.50**	**2.72**
4	C	0.332	12	**1.00**	**2.72**
5	D	0.151	12	**2.00**	**5.43**
6	A, B	1.480	EX. 18”	**0.22**	**5.31**

[1]25-year runoff rate represents the un-detained 25-year flow rate.

As shown in the table above, the outflow pipe from the proposed facility has capacity to convey the 25-year un-detained storm flow rate. Refer to Figure 5 within **Appendix A** for the pipe conveyance map.

3.6 Downstream Analysis

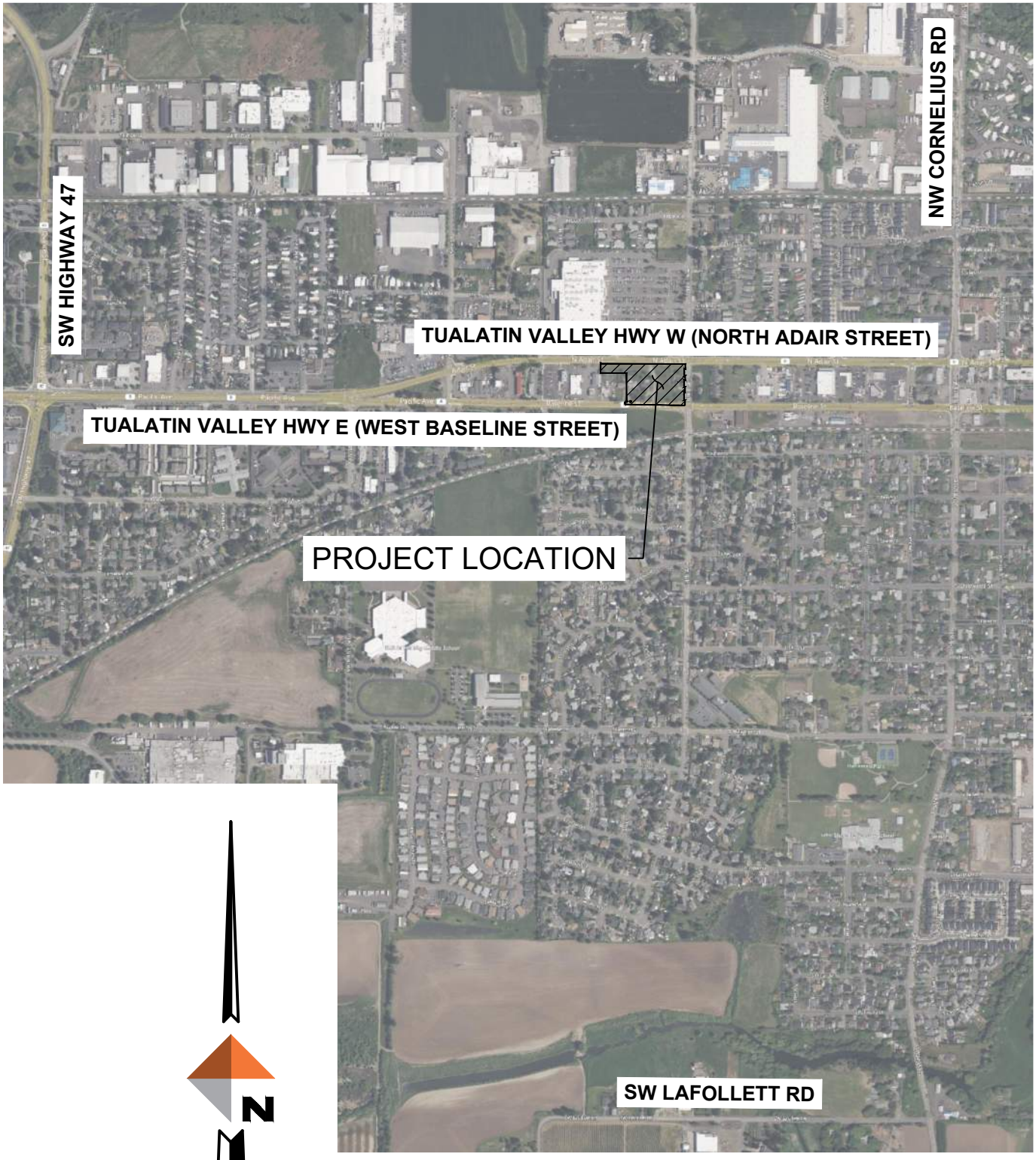
A complete downstream analysis for the project will be completed with the final report.

4.0 ENGINEERING CONCLUSION

The proposed stormwater system design follows the standards and regulations developed by Clean Water Services (CWS) and ODOT. The facility has been designed to meet or exceed the performance targets outlined by each jurisdiction.

APPENDIX A:

FIGURES & MAPS



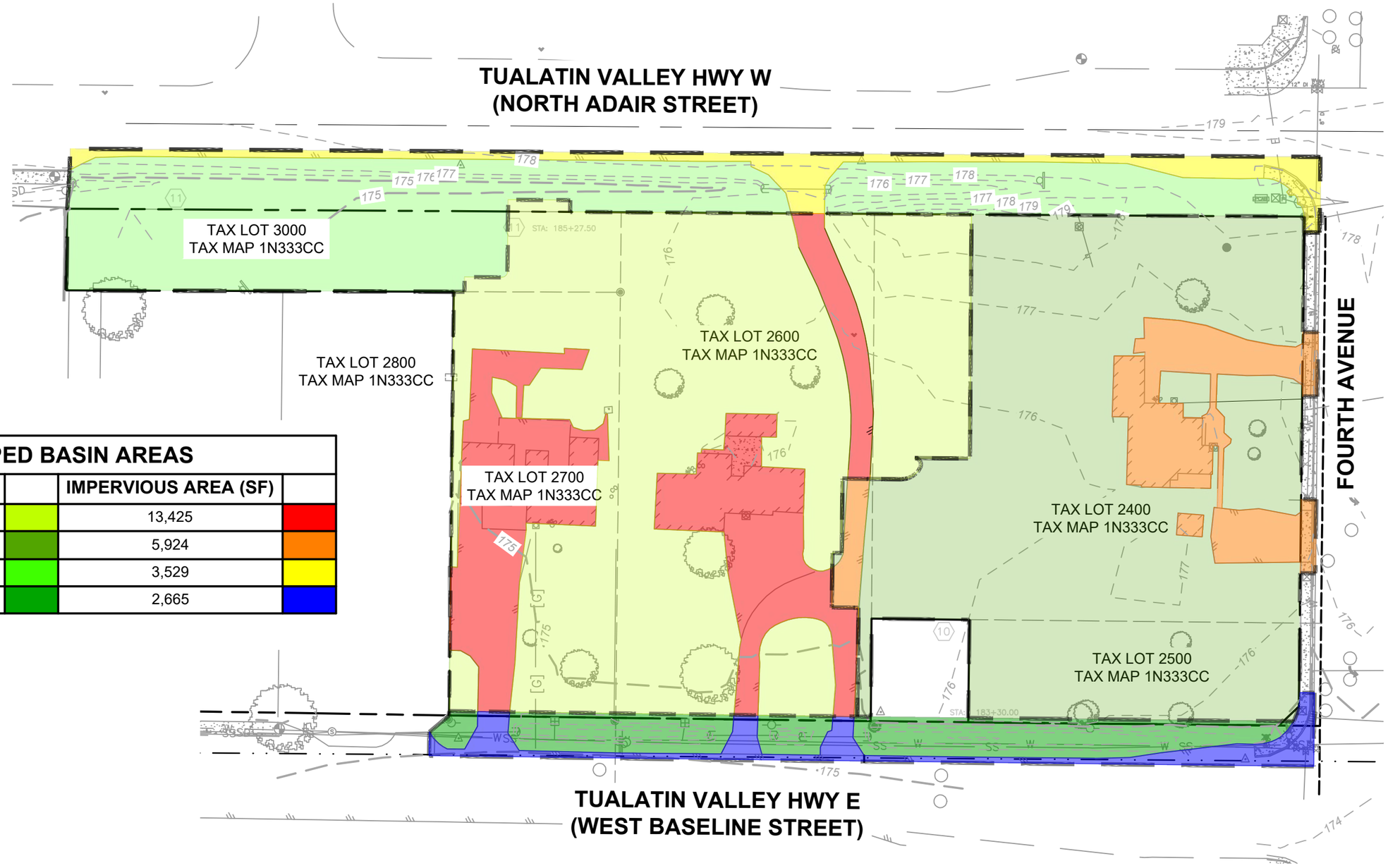
DOWL
WWW.DOWL.COM

CHICK-FIL-A CORNELIUS
VICINITY MAP
CORNELIUS, OREGON

PROJECT	16076
DATE	09/04/2024

FIG. 1

C:\dowl_pwd\0417267\FIG.1 - VICINITY MAP.dwg PLOT DATE 2024-09-04 13:49 SAVED DATE 2024-09-04 13:49 USER: drommel



PRE-DEVELOPED BASIN AREAS

BASIN	PERVIOUS AREA (SF)		IMPERVIOUS AREA (SF)	
A	36,237		13,425	
B	35,634		5,924	
C	20,433		3,529	
D	5,989		2,665	

N

50 0 50 100

SCALE IN FEET

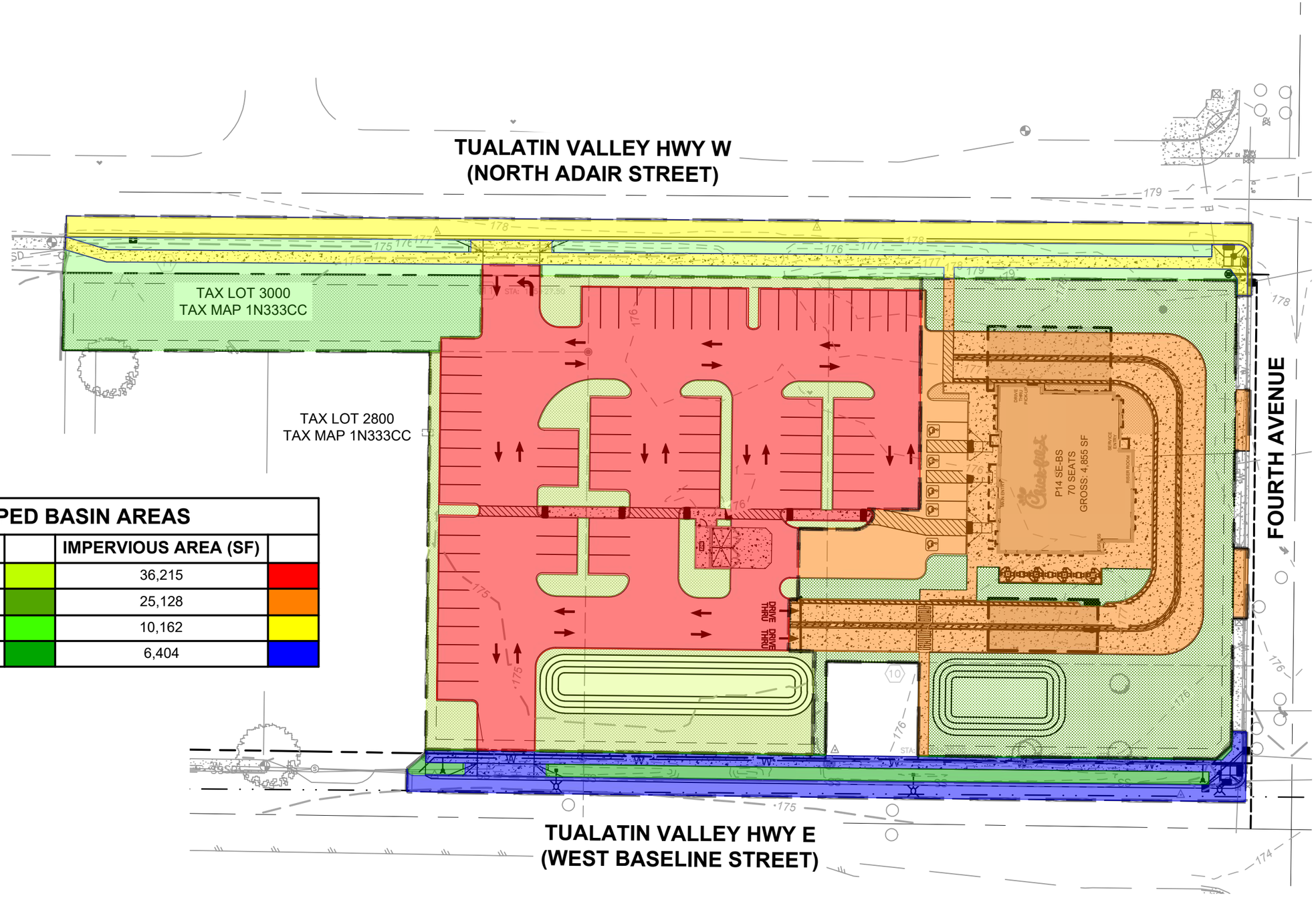
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WWW.DOWL.COM

CHICK-FIL-A CORNELIUS
PRE-DEVELOPED BASIN MAP
CORNELIUS, OREGON

PROJECT	16076
DATE	09/05/2024

FIG. 2

C:\dowl_pw\d0417267\FIG.2 - PRE-DEVELOPED BASIN MAP_recover.dwg PLOT DATE 2024-9-5 15:40 SAVED DATE 2024-09-05 15:40 USER: drommel



POST-DEVELOPED BASIN AREAS

BASIN	PERVIOUS AREA (SF)		IMPERVIOUS AREA (SF)	
A	13,447		36,215	
B	16,430		25,128	
C	13,799		10,162	
D	2,250		6,404	

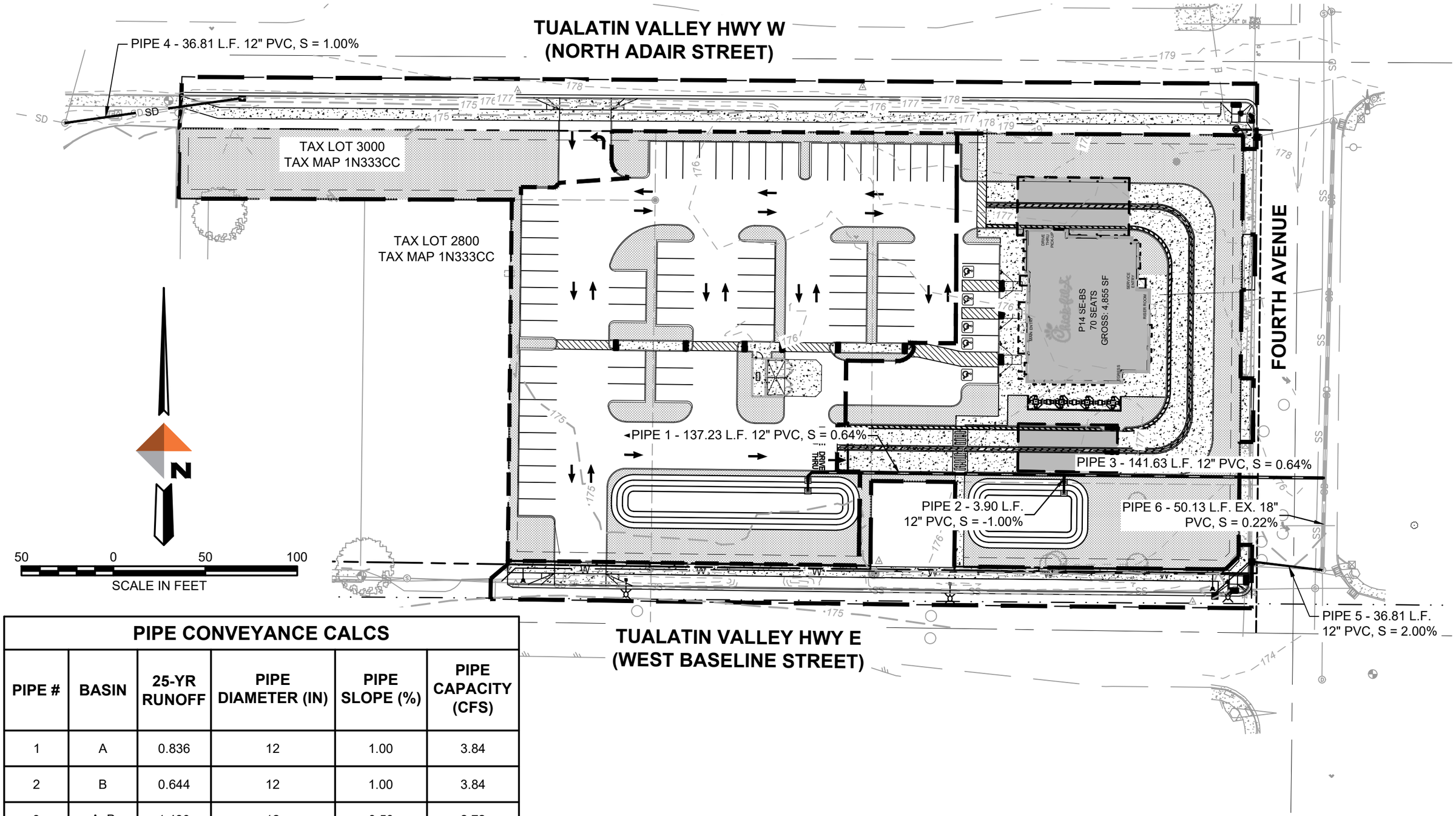
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WWW.DOWL.COM

CHICK-FIL-A CORNELIUS
POST-DEVELOPED BASIN MAP
CORNELIUS, OREGON

PROJECT	16076
DATE	09/05/2024

FIG. 3

C:\dowl_pw\d0417267\FIG.3 - POST-DEVELOPED BASIN MAP.dwg PLOT DATE 2024-0-5 15:43 SAVED DATE 2024-09-05 15:42 USER: drommel



PIPE CONVEYANCE CALCS

PIPE #	BASIN	25-YR RUNOFF	PIPE DIAMETER (IN)	PIPE SLOPE (%)	PIPE CAPACITY (CFS)
1	A	0.836	12	1.00	3.84
2	B	0.644	12	1.00	3.84
3	A, B	1.480	12	0.50	2.72
4	C	0.332	12	1.00	2.72
5	D	0.151	12	2.00	5.43
6	A, B, D	1.631	EX. 18	0.22	5.31

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CHICK-FIL-A CORNELIUS
PIPE CONVEYANCE MAP
CORNELIUS, OREGON

PROJECT	16076
DATE	09/04/2024

FIG. 5

C:\dowl_gw\d0417267\FIG.4 - PIPE CONVEYANCE MAP_recover000.dwg PLOT DATE 2024-9-5 15:31 SAVED DATE 2024-09-05 15:30 USER: drommel

APPENDIX B:

SOIL SURVEY DATA

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

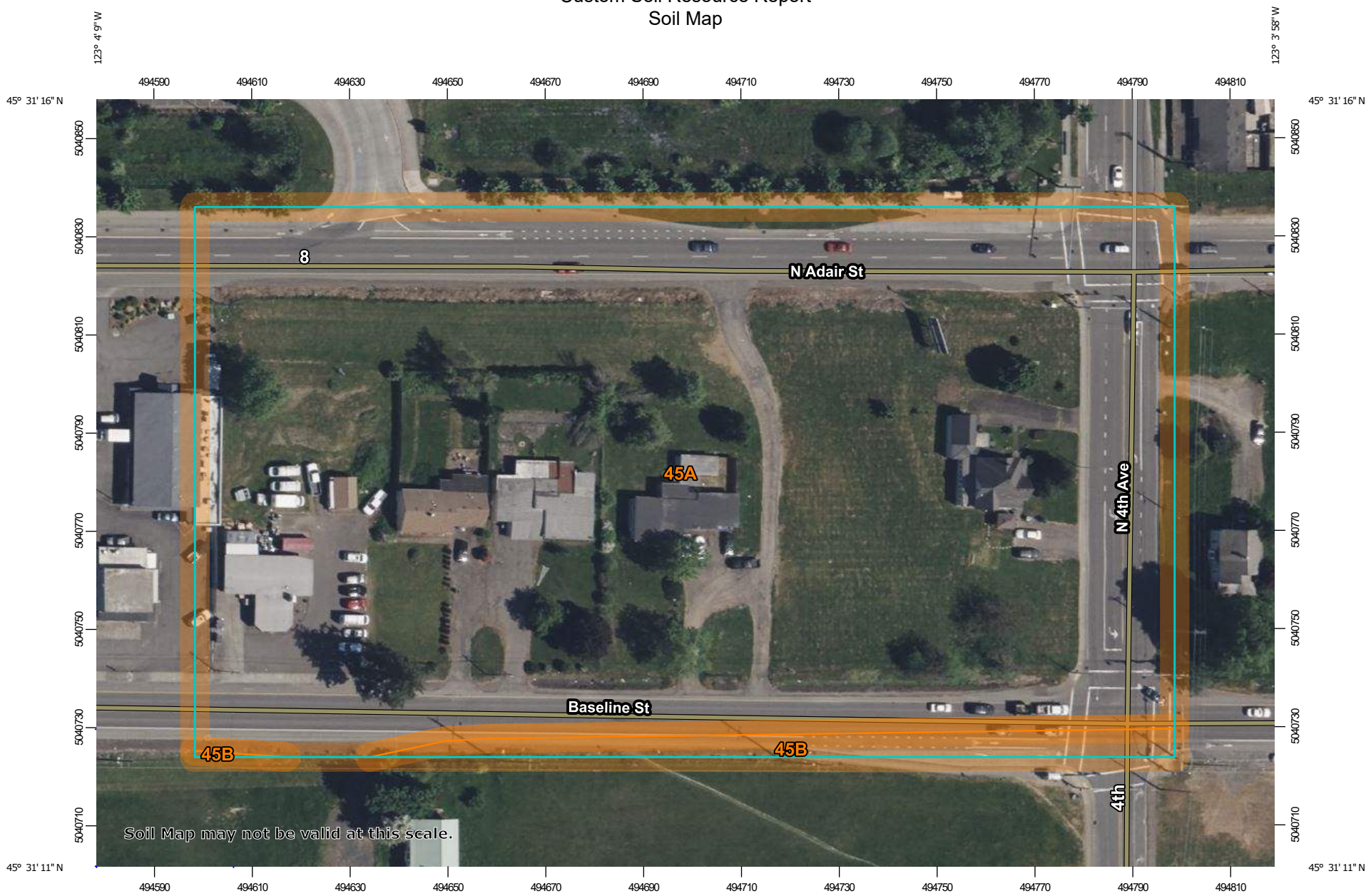
A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Washington County, Oregon



August 21, 2024

Custom Soil Resource Report
Soil Map



Map Scale: 1:1,100 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 15 30 60 90

Feet
0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Washington County, Oregon
Survey Area Data: Version 23, Sep 7, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: May 17, 2023—Jun 3, 2023

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
45A	Woodburn silt loam, 0 to 3 percent slopes	5.4	96.7%
45B	Woodburn silt loam, 3 to 7 percent slopes	0.2	3.3%
Totals for Area of Interest		**5.6**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however,

onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Washington County, Oregon

45A—Woodburn silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2208
Elevation: 150 to 400 feet
Mean annual precipitation: 40 to 50 inches
Mean annual air temperature: 50 to 54 degrees F
Frost-free period: 165 to 210 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Woodburn and similar soils: 85 percent
Minor components: 1 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Woodburn

Setting

Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Old alluvium

Typical profile

H1 - 0 to 16 inches: silt loam
H2 - 16 to 31 inches: silty clay loam
H3 - 31 to 60 inches: silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 25 to 32 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 12.0 inches)

Interpretive groups

Land capability classification (irrigated): 2w
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C
Ecological site: R002XC008OR - Valley Terrace Group
Forage suitability group: Moderately Well Drained < 15% Slopes (G002XY004OR)
Other vegetative classification: Moderately Well Drained < 15% Slopes (G002XY004OR)
Hydric soil rating: No

Minor Components

Dayton

Percent of map unit: 1 percent

Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Poorly Drained (G002XY006OR)
Hydric soil rating: Yes

45B—Woodburn silt loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 2209
Elevation: 150 to 400 feet
Mean annual precipitation: 40 to 50 inches
Mean annual air temperature: 50 to 54 degrees F
Frost-free period: 165 to 210 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Woodburn and similar soils: 85 percent
Minor components: 1 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Woodburn

Setting

Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Old alluvium

Typical profile

H1 - 0 to 16 inches: silt loam
H2 - 16 to 31 inches: silty clay loam
H3 - 31 to 60 inches: silt loam

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 25 to 32 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 12.0 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C

Ecological site: R002XC008OR - Valley Terrace Group
Forage suitability group: Moderately Well Drained < 15% Slopes (G002XY004OR)
Other vegetative classification: Moderately Well Drained < 15% Slopes (G002XY004OR)
Hydric soil rating: No

Minor Components

Dayton

Percent of map unit: 1 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Poorly Drained (G002XY006OR)
Hydric soil rating: Yes

Table 2-2a Runoff curve numbers for urban areas [1/]

Cover description: Cover type and hydrologic condition	Average percent impervious area [2/]	Curve numbers for hydrologic soil group: A	B	C	D
Fully developed urban areas (vegetation established)					
Open space (lawns, parks, golf courses, cemeteries, etc.) [3/]:					
Poor condition (grass cover < 50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	69	79	84
Good condition (grass cover > 75%)		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way)		98	98	98	98
Paved; open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Dirt (including right-of-way)		72	82	87	89
Western desert urban areas:					
Natural desert landscaping (pervious areas only) [4/]		63	77	85	88
Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders)		96	96	96	96
Urban districts:					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size:					
1/8 acre or less (town houses)	65	77	85	90	92
1/4 acre	38	61	75	83	87
1/3 acre	30	57	72	81	86
1/2 acre	25	54	70	80	85
1 acre	20	51	68	79	84
2 acres	12	46	65	77	82
Developing urban areas					
Newly graded areas (pervious areas only, no vegetation) [5/]		77	86	91	94
Idle lands (CN's are determined using cover types similar to those in table 2-2c).					

[1] Average runoff condition, and $I_a = 0.2S$.

[2] The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using figure 2-3 or 2-4.

[3] CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.

[4] Composite CN's for natural desert landscaping should be computed using figures 2-3 or 2-4 based on the impervious area percentage (CN = 98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrub in poor hydrologic condition.

[5] Composite CN's to use for the design of temporary measures during grading and construction should be computed using figure 2-3 or 2-4 based on the degree of development (impervious area percentage) and the CN's for the newly graded pervious areas.

APPENDIX C:

ONSITE STORMWATER CALCULATIONS & HYDROGRAPHS

Hydraflow Table of Contents

2 - Year

Summary Report **1**
Hydrograph Reports **2**
Hydrograph No. 1, SBUH Runoff, Basin A - Pre-Developed - Pervious 2
Hydrograph No. 2, SBUH Runoff, Basin A - Pre-Developed - Impervious 3
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Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

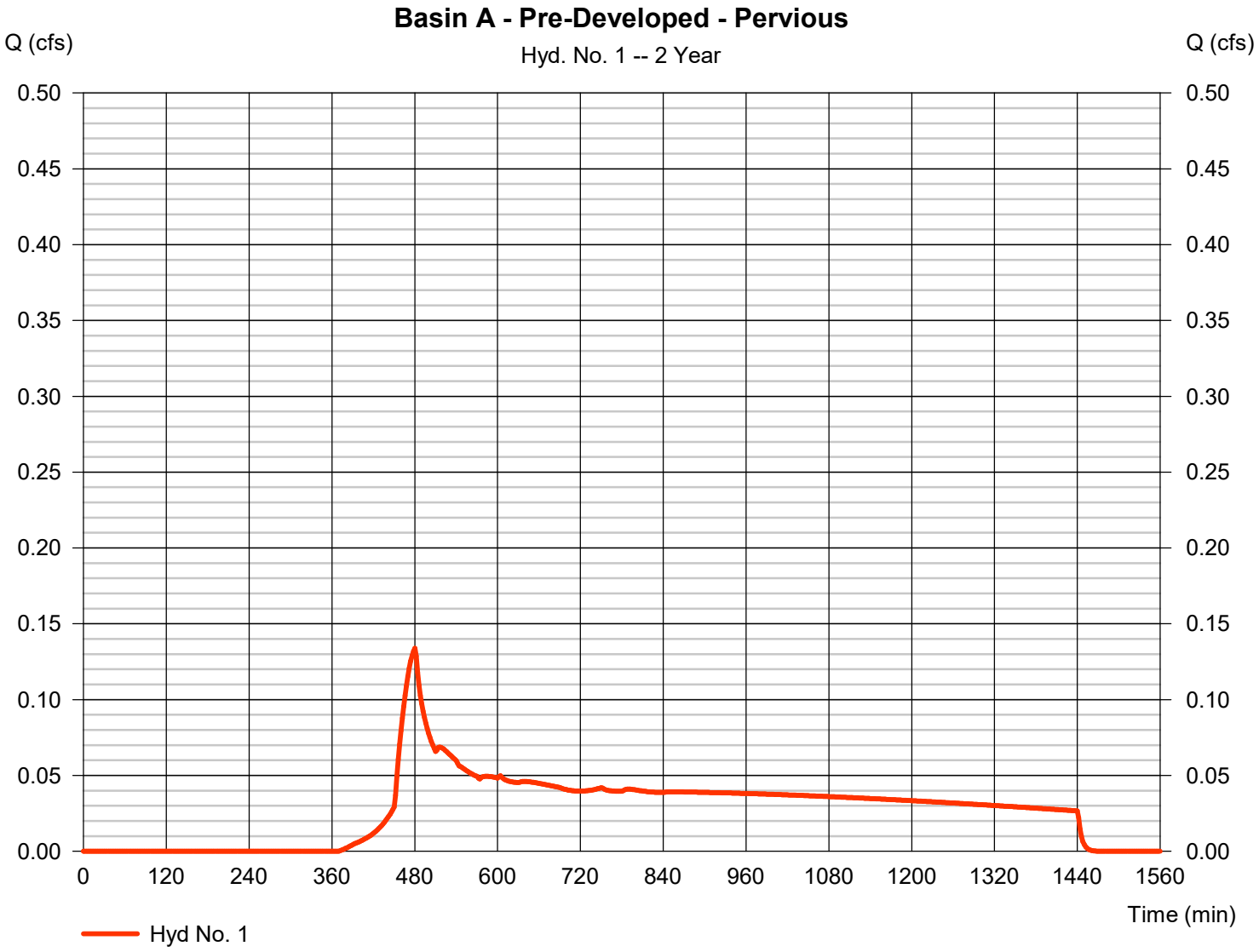
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SBUH Runoff	0.134	2	480	2,529	------	------	------	Basin A - Pre-Developed - Pervious
2	SBUH Runoff	0.177	2	474	2,539	------	------	------	Basin A - Pre-Developed - Impervious
3	Combine	0.307	2	478	5,068	1, 2	------	------	Basin A Pre-Developed
4	SBUH Runoff	0.132	2	480	2,487	------	------	------	Basin B - Pre-Developed - Pervious
5	SBUH Runoff	0.078	2	474	1,121	------	------	------	Basin B - Pre-Developed - Impervious
6	Combine	0.208	2	480	3,608	4, 5	------	------	Basin B Pre-Developed
8	SBUH Runoff	0.027	2	480	682	------	------	------	Basin A - Post-Developed - Pervious
9	SBUH Runoff	0.479	2	474	6,850	------	------	------	Basin A - Post-Developed - Imperviou
10	Combine	0.502	2	474	7,532	8, 9	------	------	Basin A Post-Developed
12	SBUH Runoff	0.033	2	480	832	------	------	------	Basin B - Post-Developed - Pervious
13	SBUH Runoff	0.332	2	474	4,756	------	------	------	Basin B - Post-Developed - Imperviou
14	Combine	0.361	2	476	5,588	12, 13	------	------	Basin B Post-Developed
16	Reservoir	0.155	2	544	7,307	10	174.23	1,539	Facility A
18	Reservoir	0.100	2	562	5,573	14	173.85	1,684	Facility B

Hydrograph Report

Hyd. No. 1

Basin A - Pre-Developed - Pervious

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.134 cfs
Storm frequency	= 2 yrs	Time to peak	= 480 min
Time interval	= 2 min	Hyd. volume	= 2,529 cuft
Drainage area	= 0.832 ac	Curve number	= 79
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 2.50 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

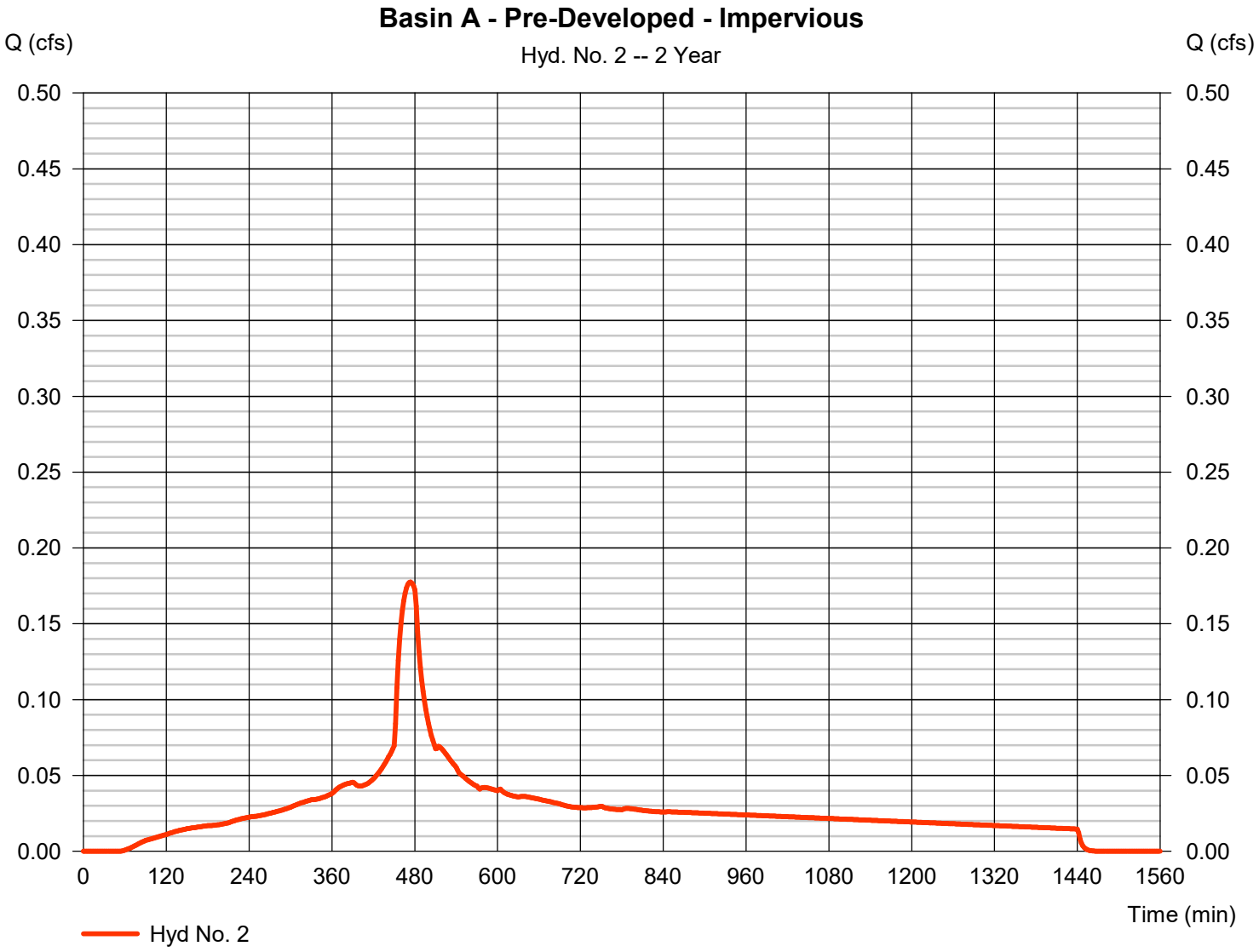


Hydrograph Report

Hyd. No. 2

Basin A - Pre-Developed - Impervious

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.177 cfs
Storm frequency	= 2 yrs	Time to peak	= 474 min
Time interval	= 2 min	Hyd. volume	= 2,539 cuft
Drainage area	= 0.308 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 2.50 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

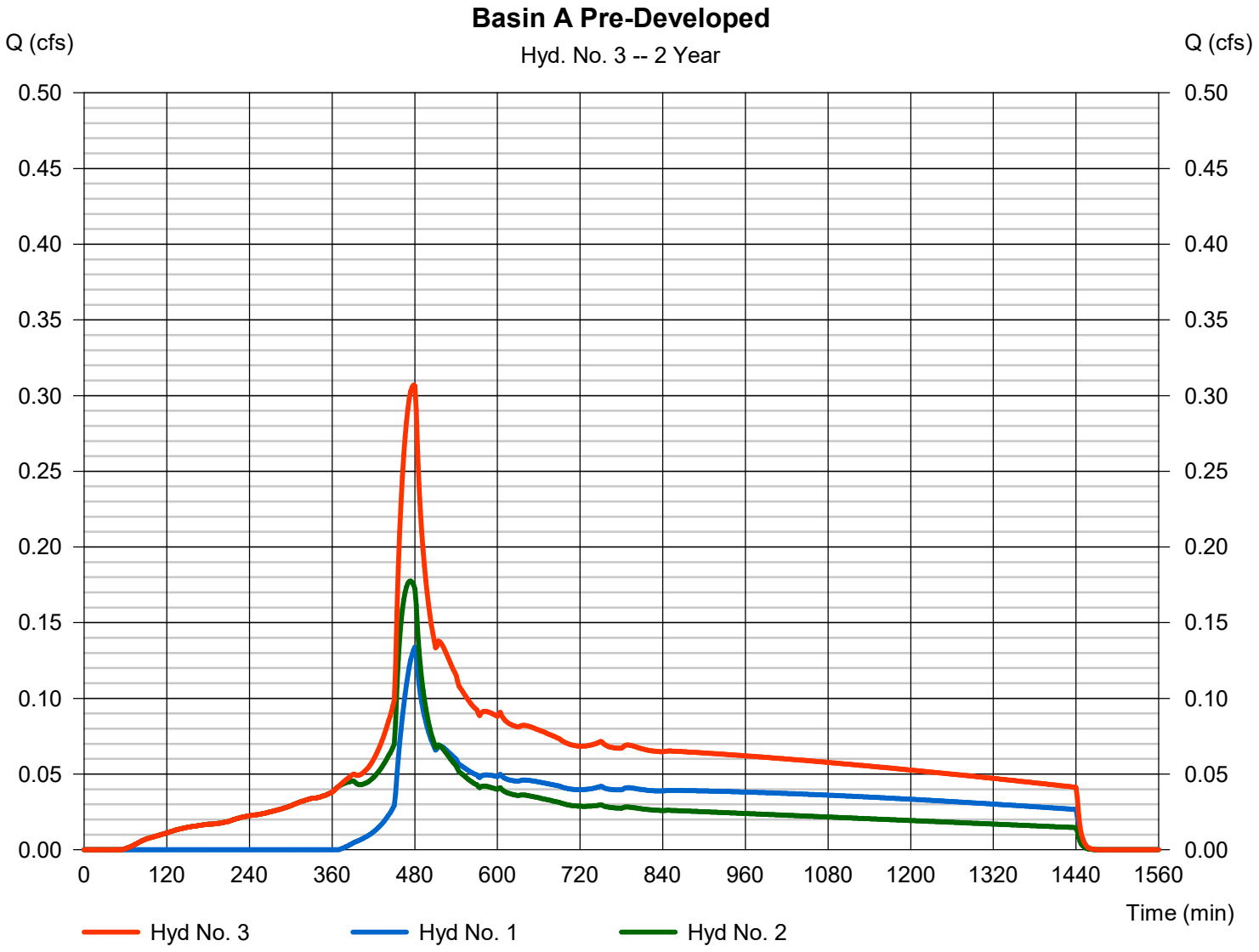


Hydrograph Report

Hyd. No. 3

Basin A Pre-Developed

Hydrograph type	=	Combine	Peak discharge	=	0.307 cfs
Storm frequency	=	2 yrs	Time to peak	=	478 min
Time interval	=	2 min	Hyd. volume	=	5,068 cuft
Inflow hyds.	=	1, 2	Contrib. drain. area	=	1.140 ac

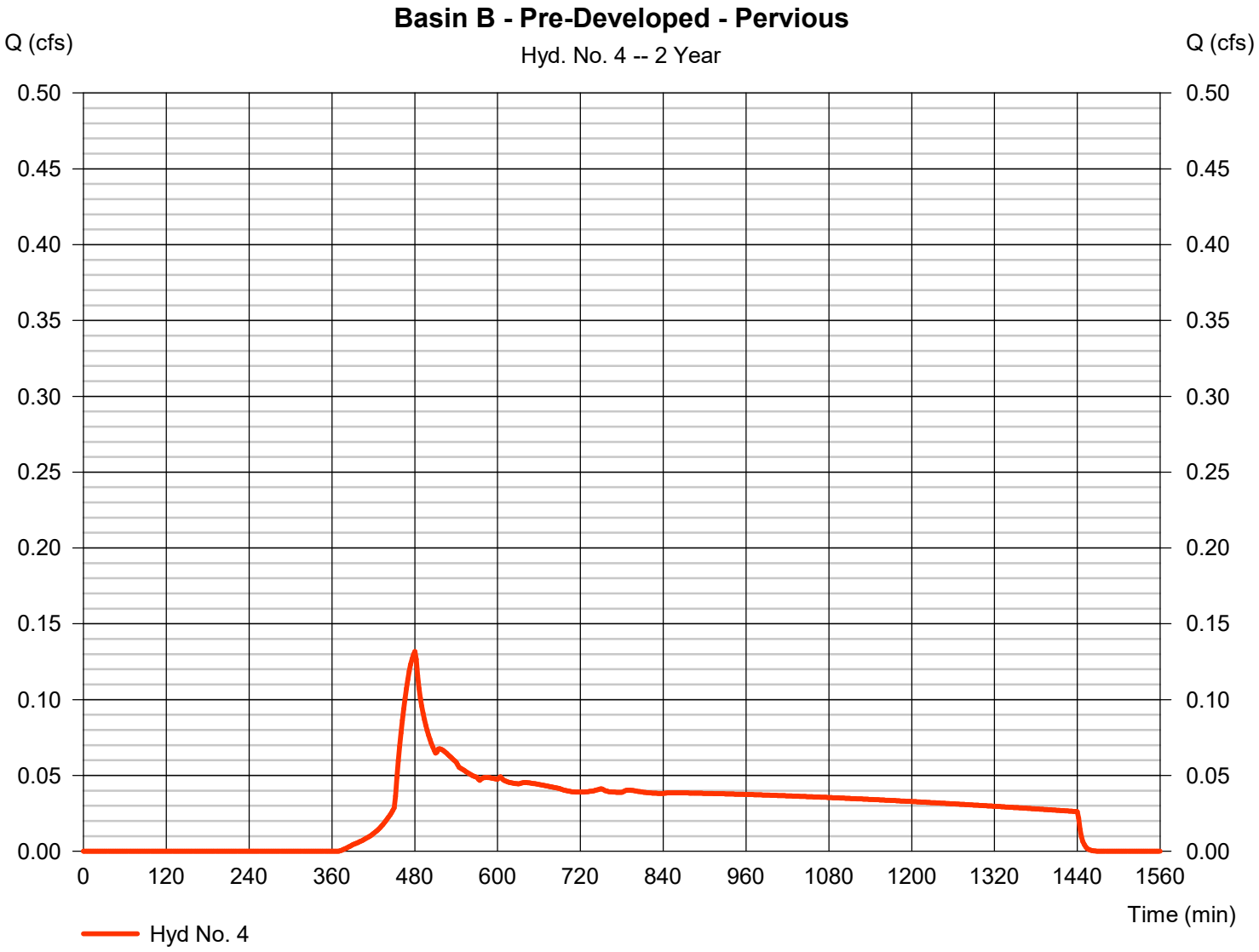


Hydrograph Report

Hyd. No. 4

Basin B - Pre-Developed - Pervious

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.132 cfs
Storm frequency	= 2 yrs	Time to peak	= 480 min
Time interval	= 2 min	Hyd. volume	= 2,487 cuft
Drainage area	= 0.818 ac	Curve number	= 79
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 2.50 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

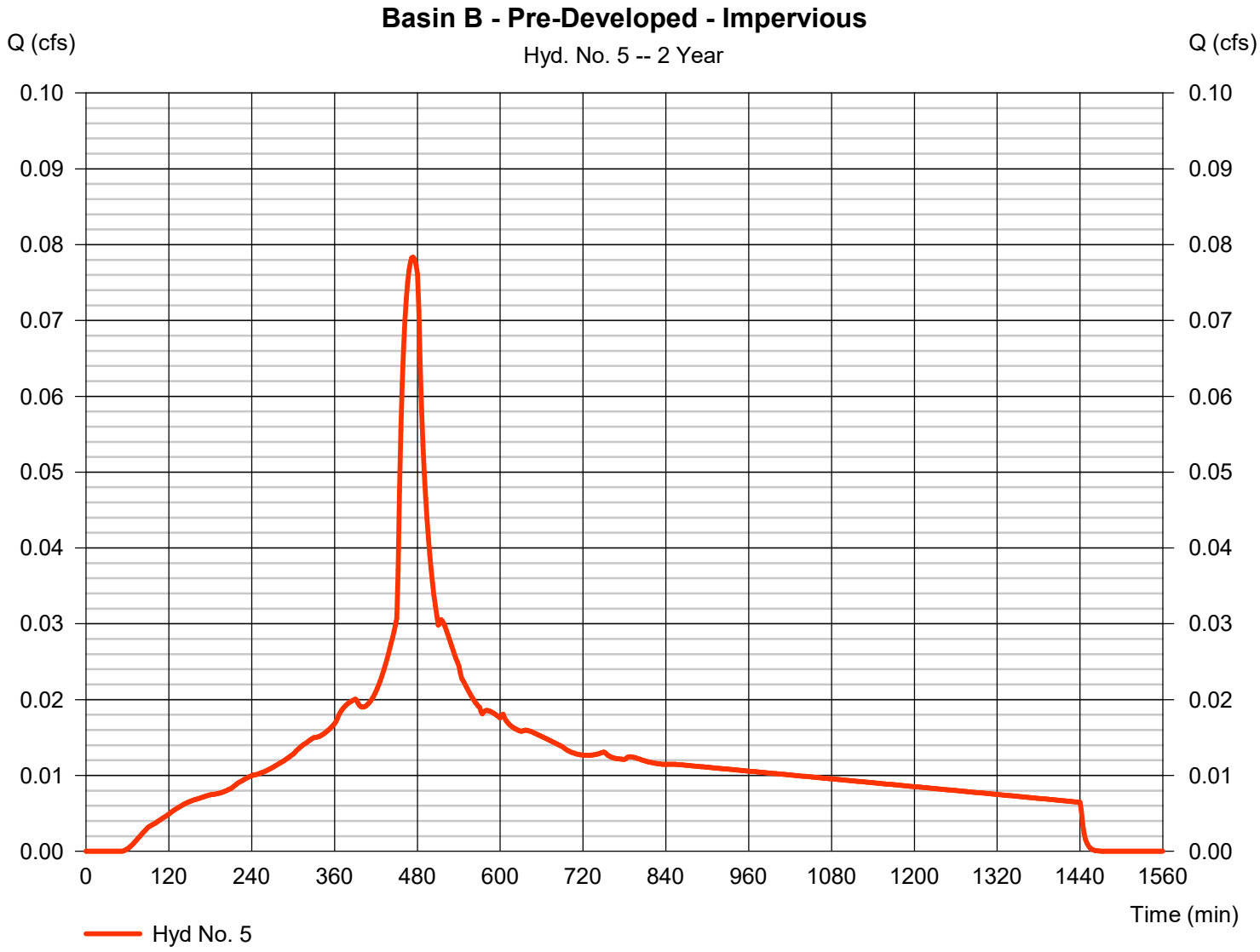


Hydrograph Report

Hyd. No. 5

Basin B - Pre-Developed - Impervious

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.078 cfs
Storm frequency	= 2 yrs	Time to peak	= 474 min
Time interval	= 2 min	Hyd. volume	= 1,121 cuft
Drainage area	= 0.136 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 2.50 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

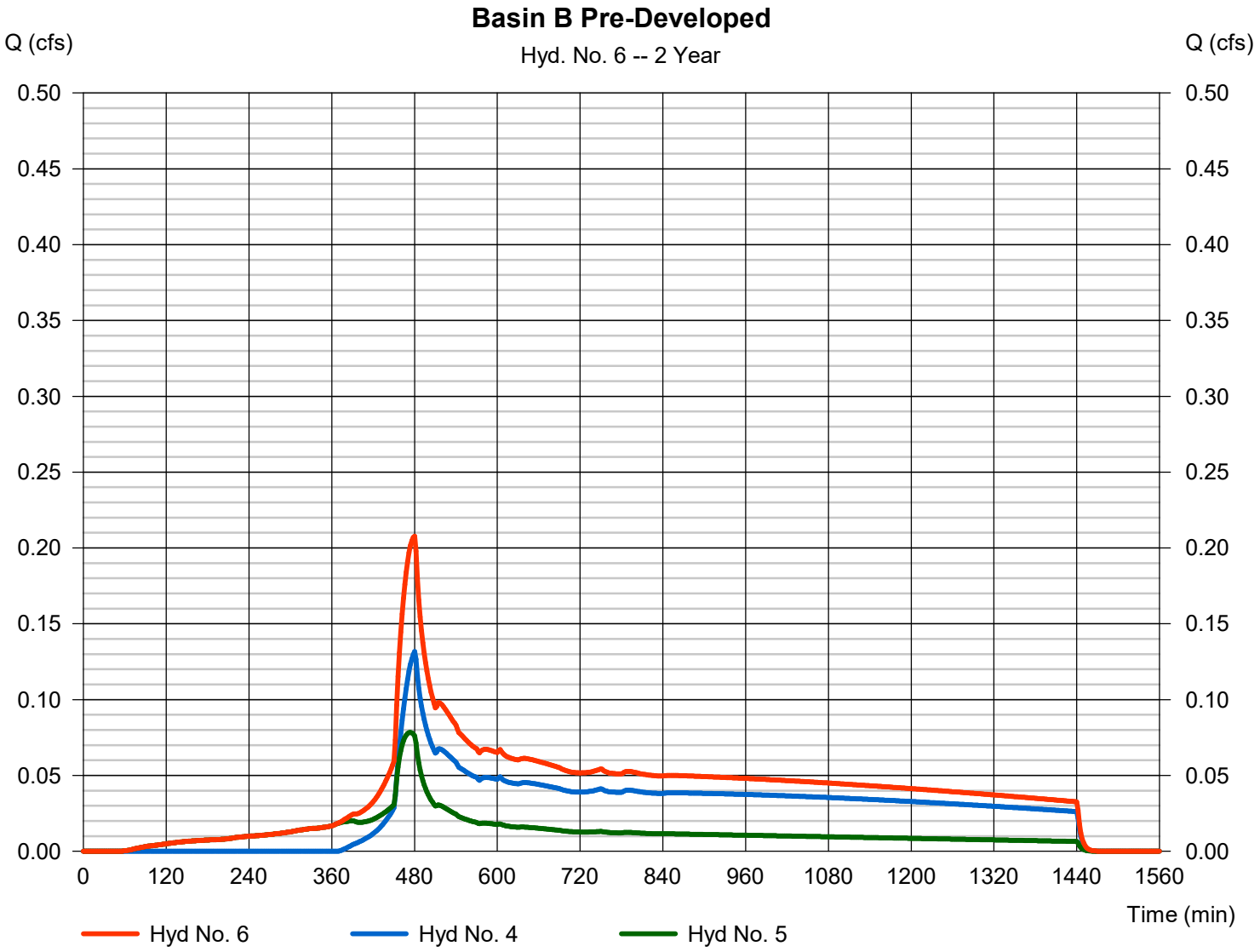


Hydrograph Report

Hyd. No. 6

Basin B Pre-Developed

Hydrograph type	= Combine	Peak discharge	= 0.208 cfs
Storm frequency	= 2 yrs	Time to peak	= 480 min
Time interval	= 2 min	Hyd. volume	= 3,608 cuft
Inflow hyds.	= 4, 5	Contrib. drain. area	= 0.954 ac

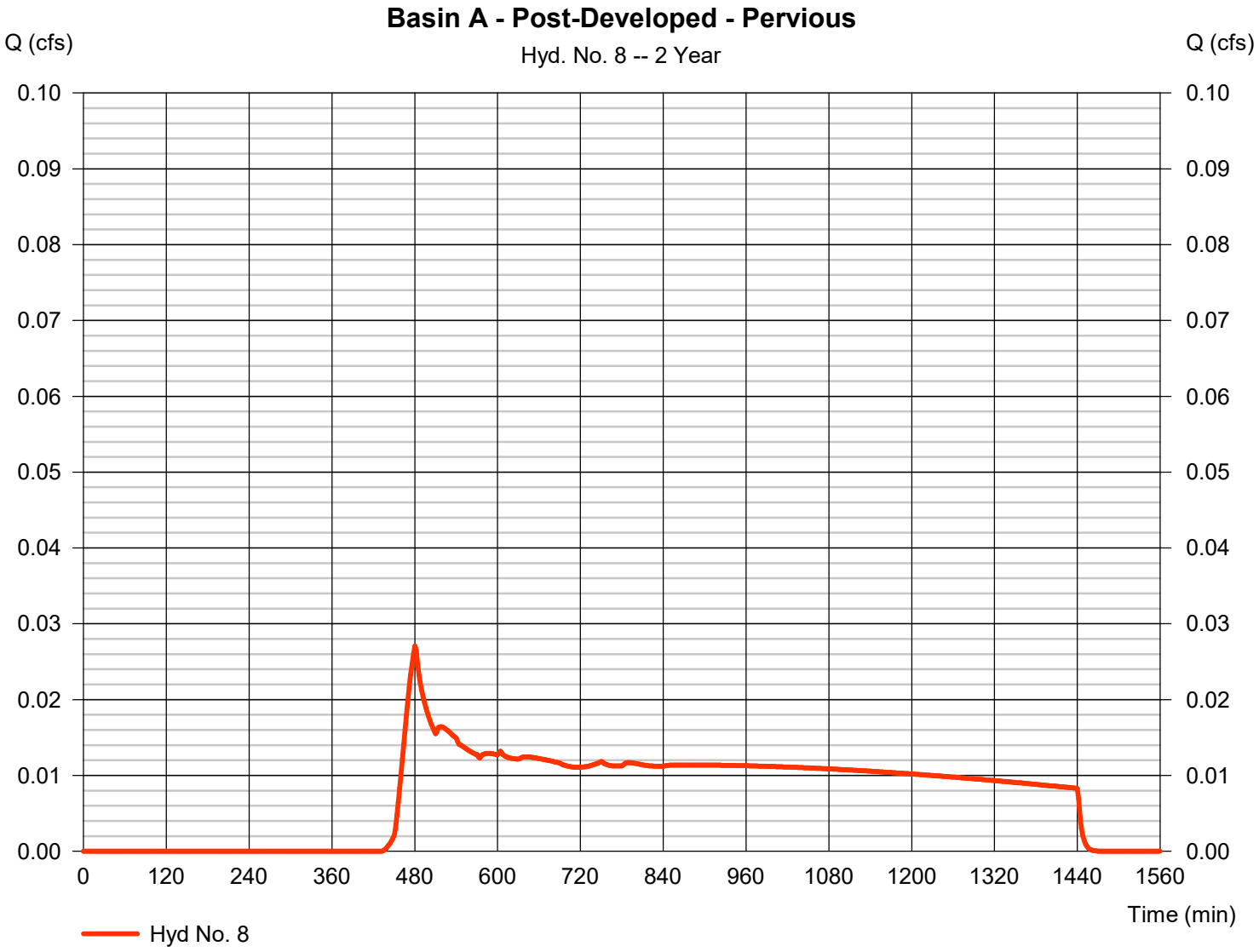


Hydrograph Report

Hyd. No. 8

Basin A - Post-Developed - Pervious

Hydrograph type	=	SBUH Runoff	Peak discharge	=	0.027 cfs
Storm frequency	=	2 yrs	Time to peak	=	480 min
Time interval	=	2 min	Hyd. volume	=	682 cuft
Drainage area	=	0.309 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	2.50 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a

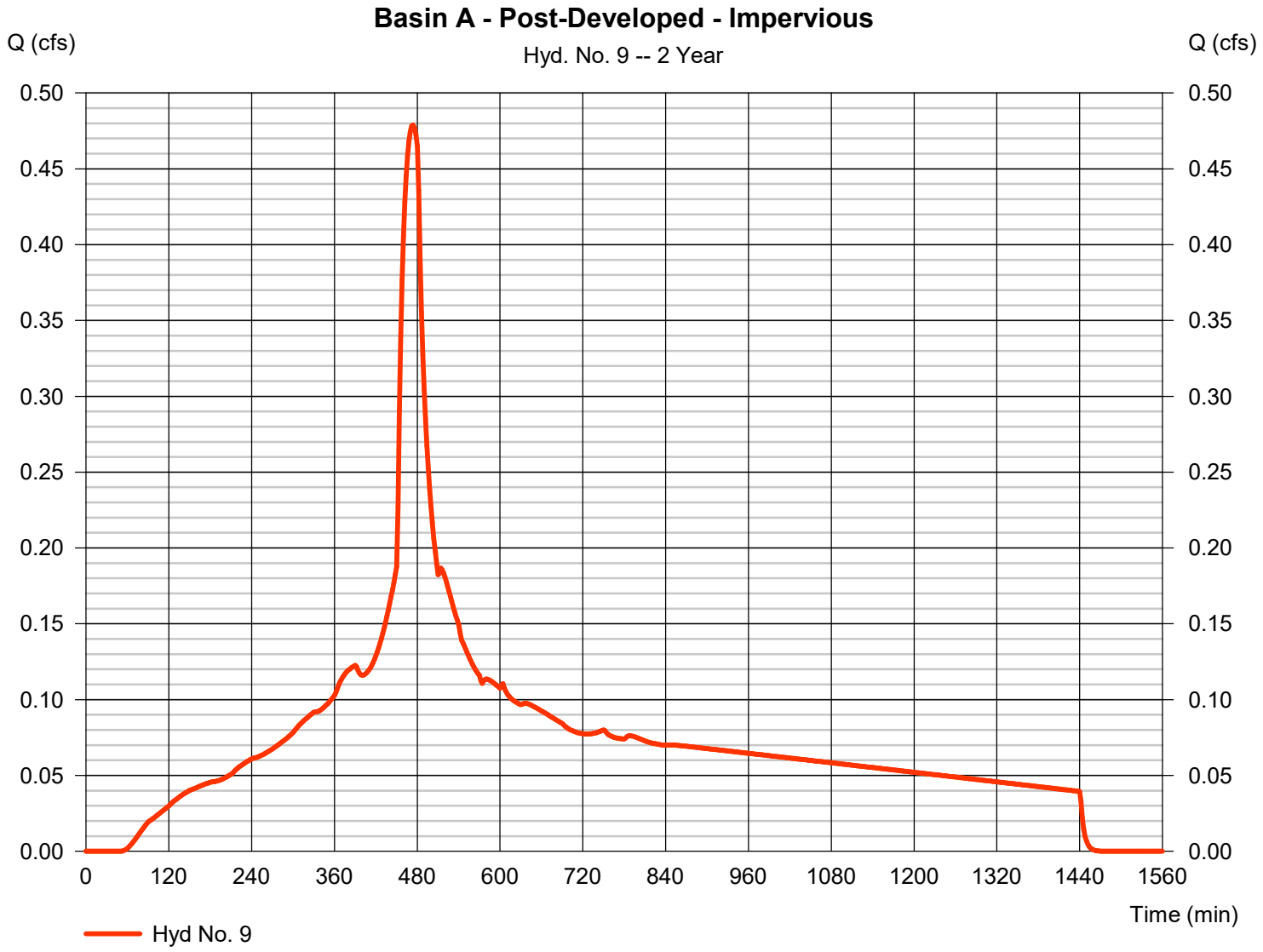


Hydrograph Report

Hyd. No. 9

Basin A - Post-Developed - Impervious

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.479 cfs
Storm frequency	= 2 yrs	Time to peak	= 474 min
Time interval	= 2 min	Hyd. volume	= 6,850 cuft
Drainage area	= 0.831 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 2.50 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

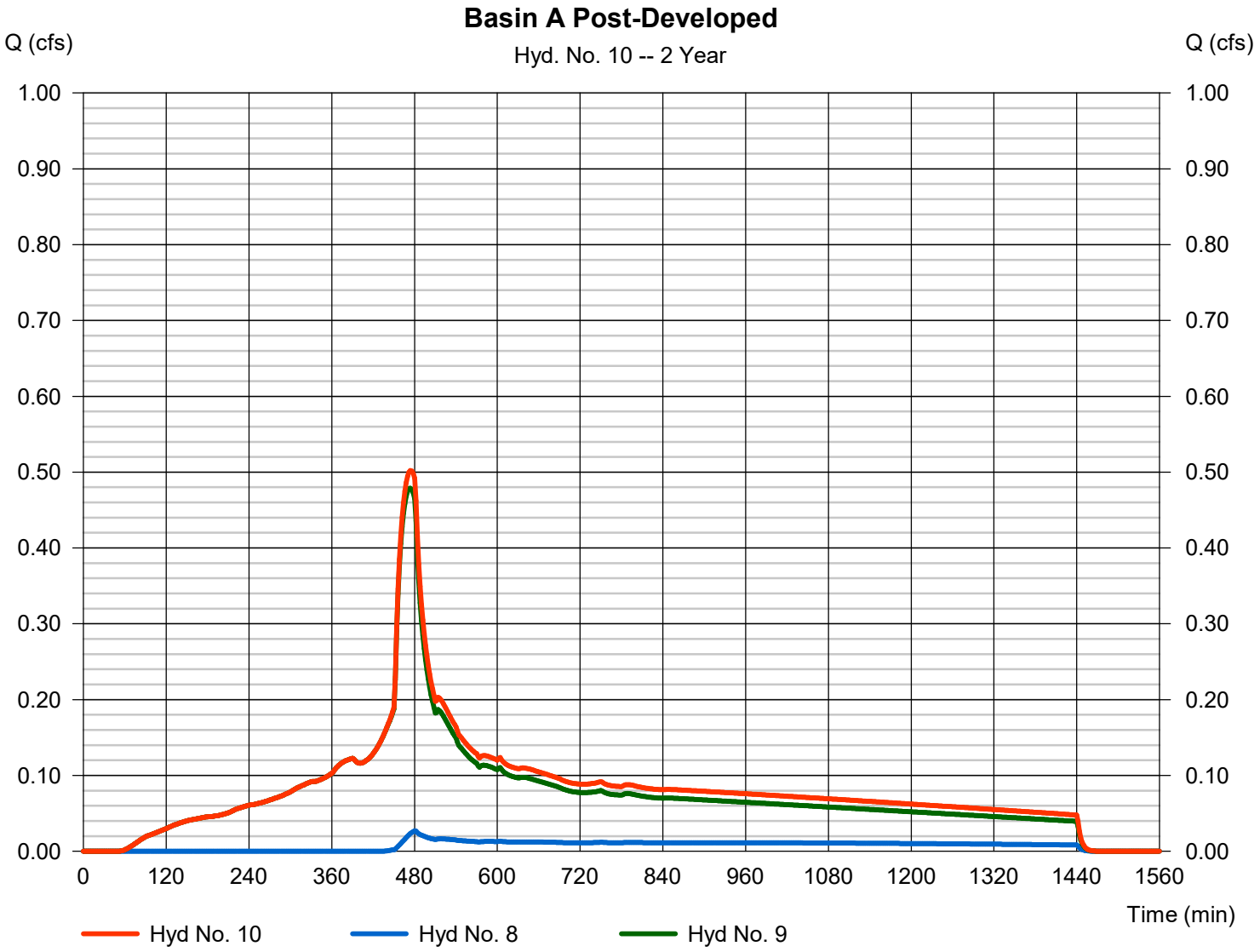


Hydrograph Report

Hyd. No. 10

Basin A Post-Developed

Hydrograph type	=	Combine	Peak discharge	=	0.502 cfs
Storm frequency	=	2 yrs	Time to peak	=	474 min
Time interval	=	2 min	Hyd. volume	=	7,532 cuft
Inflow hyds.	=	8, 9	Contrib. drain. area	=	1.140 ac

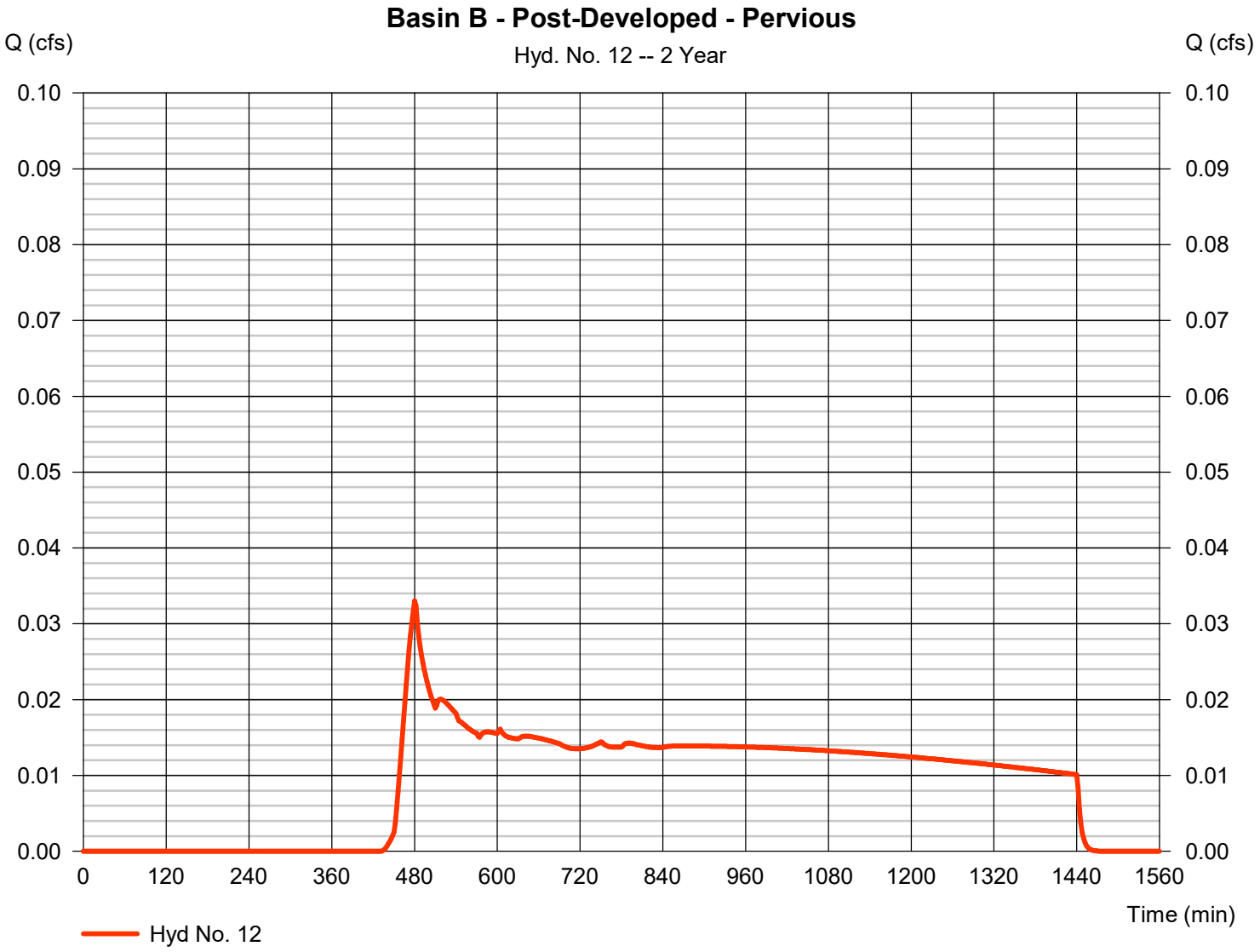


Hydrograph Report

Hyd. No. 12

Basin B - Post-Developed - Pervious

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.033 cfs
Storm frequency	= 2 yrs	Time to peak	= 480 min
Time interval	= 2 min	Hyd. volume	= 832 cuft
Drainage area	= 0.377 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 2.50 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

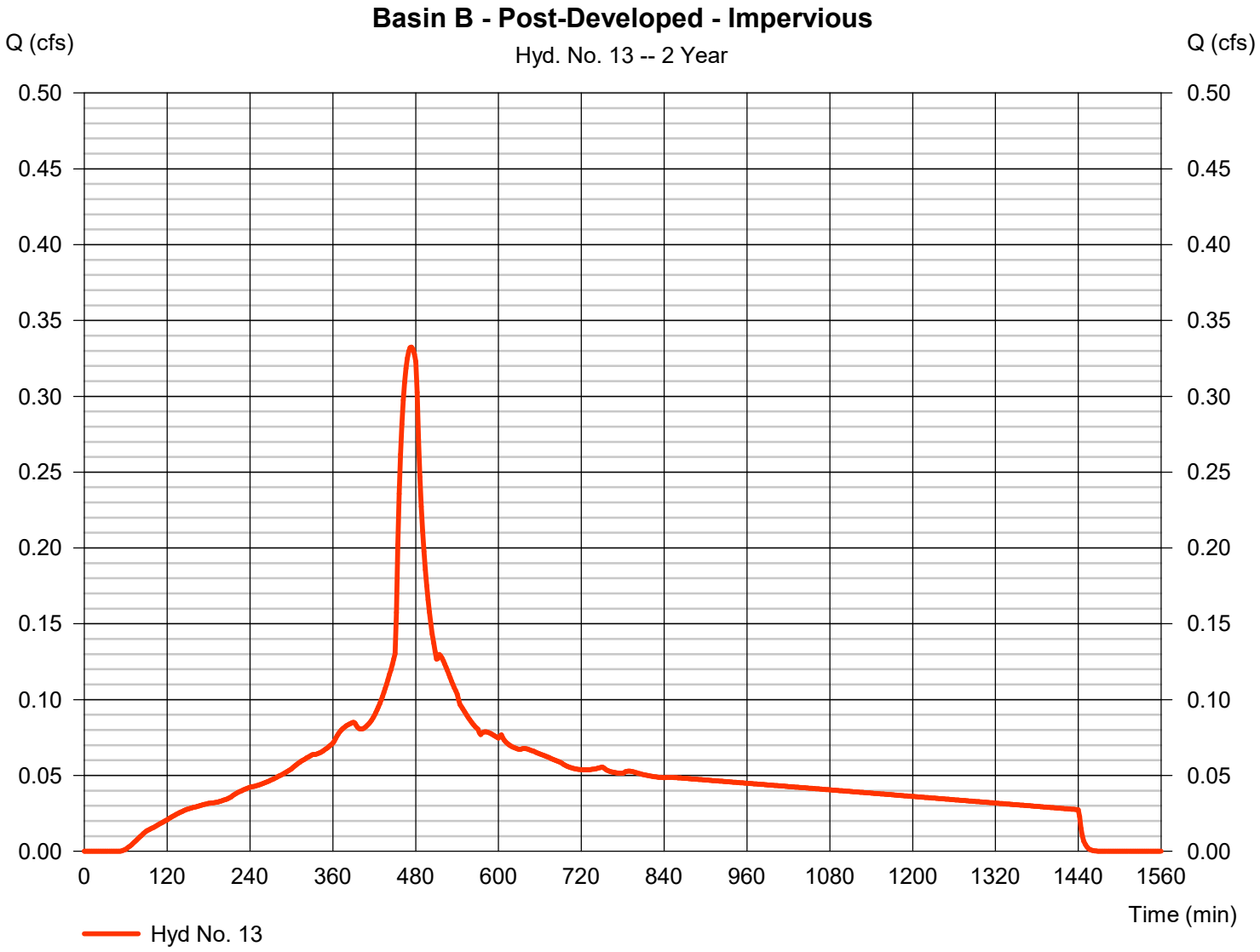


Hydrograph Report

Hyd. No. 13

Basin B - Post-Developed - Impervious

Hydrograph type	=	SBUH Runoff	Peak discharge	=	0.332 cfs
Storm frequency	=	2 yrs	Time to peak	=	474 min
Time interval	=	2 min	Hyd. volume	=	4,756 cuft
Drainage area	=	0.577 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	2.50 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a

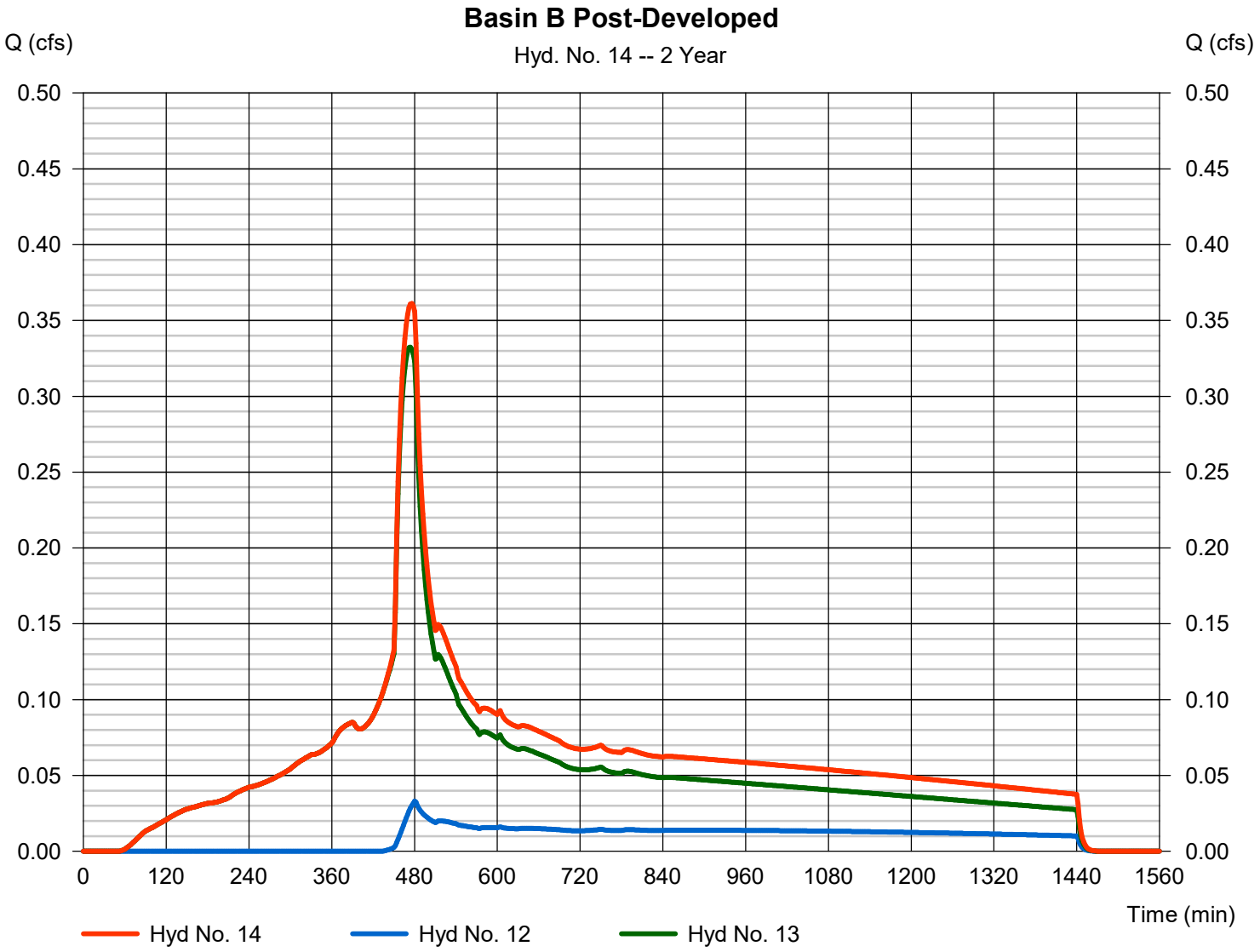


Hydrograph Report

Hyd. No. 14

Basin B Post-Developed

Hydrograph type	=	Combine	Peak discharge	=	0.361 cfs
Storm frequency	=	2 yrs	Time to peak	=	476 min
Time interval	=	2 min	Hyd. volume	=	5,588 cuft
Inflow hyds.	=	12, 13	Contrib. drain. area	=	0.954 ac



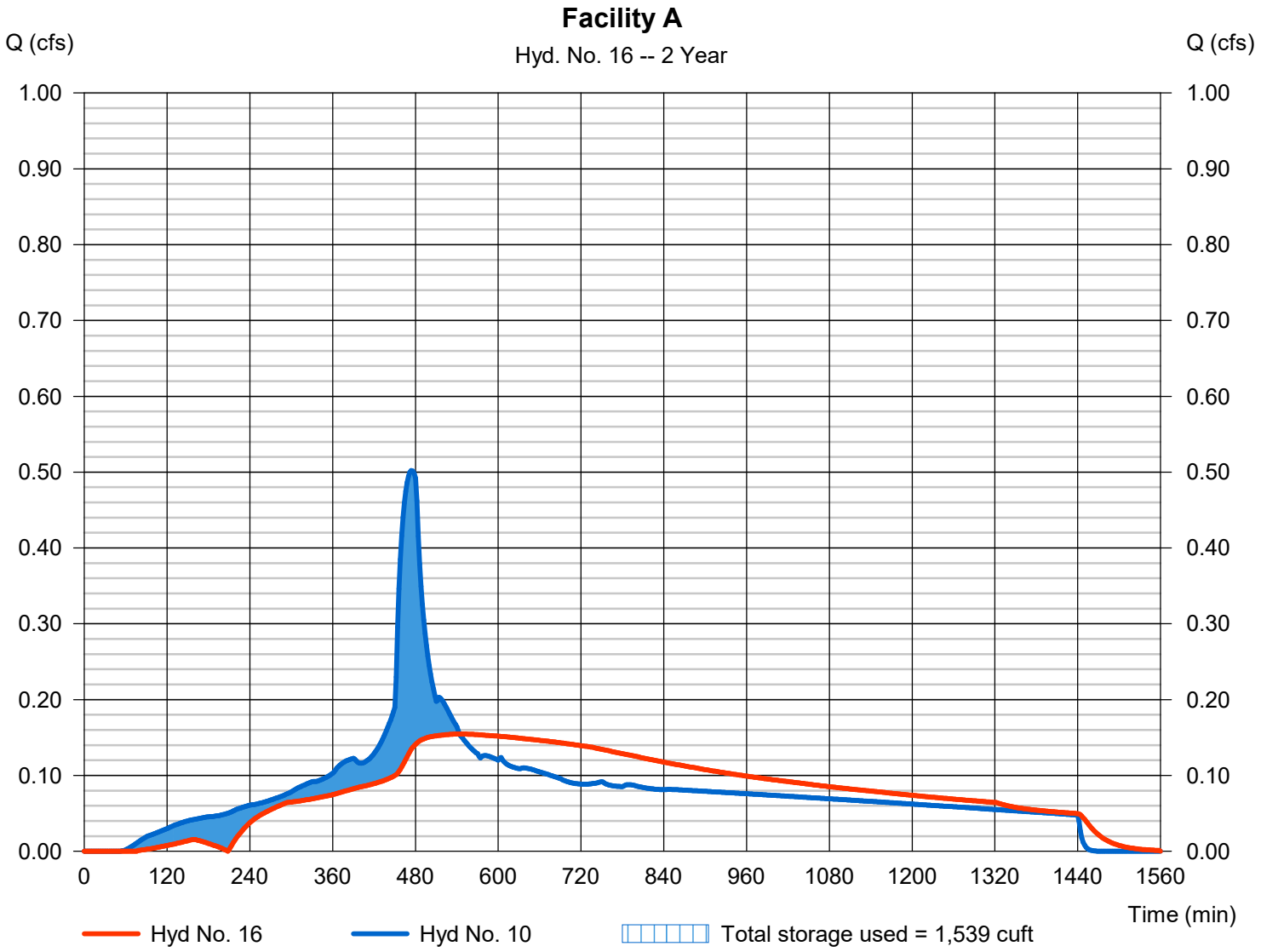
Hydrograph Report

Hyd. No. 16

Facility A

Hydrograph type	=	Reservoir	Peak discharge	=	0.155 cfs
Storm frequency	=	2 yrs	Time to peak	=	544 min
Time interval	=	2 min	Hyd. volume	=	7,307 cuft
Inflow hyd. No.	=	10 - Basin A Post-Developed	Max. Elevation	=	174.23 ft
Reservoir name	=	Extended Dry Basin A	Max. Storage	=	1,539 cuft

Storage Indication method used.



Pond Report

Pond No. 1 - Extended Dry Basin A

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 173.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	173.00	799	0	0
1.00	174.00	1,464	1,115	1,115
2.00	175.00	2,186	1,813	2,928
3.00	176.00	2,965	2,565	5,493

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 12.00	2.30	5.00	0.00
Span (in)	= 12.00	2.30	5.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 173.00	173.00	174.50	0.00
Length (ft)	= 100.00	0.00	0.00	0.00
Slope (%)	= 1.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	Yes	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 4.71	0.00	0.00	0.00
Crest El. (ft)	= 175.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	173.00	0.00	0.00	0.00	---	0.00	---	---	---	---	---	0.000
1.00	1,115	174.00	0.13 ic	0.13 ic	0.00	---	0.00	---	---	---	---	---	0.127
2.00	2,928	175.00	0.54 ic	0.18 ic	0.35 ic	---	0.00	---	---	---	---	---	0.532
3.00	5,493	176.00	0.97 ic	0.22 ic	0.75 ic	---	15.68	---	---	---	---	---	16.65

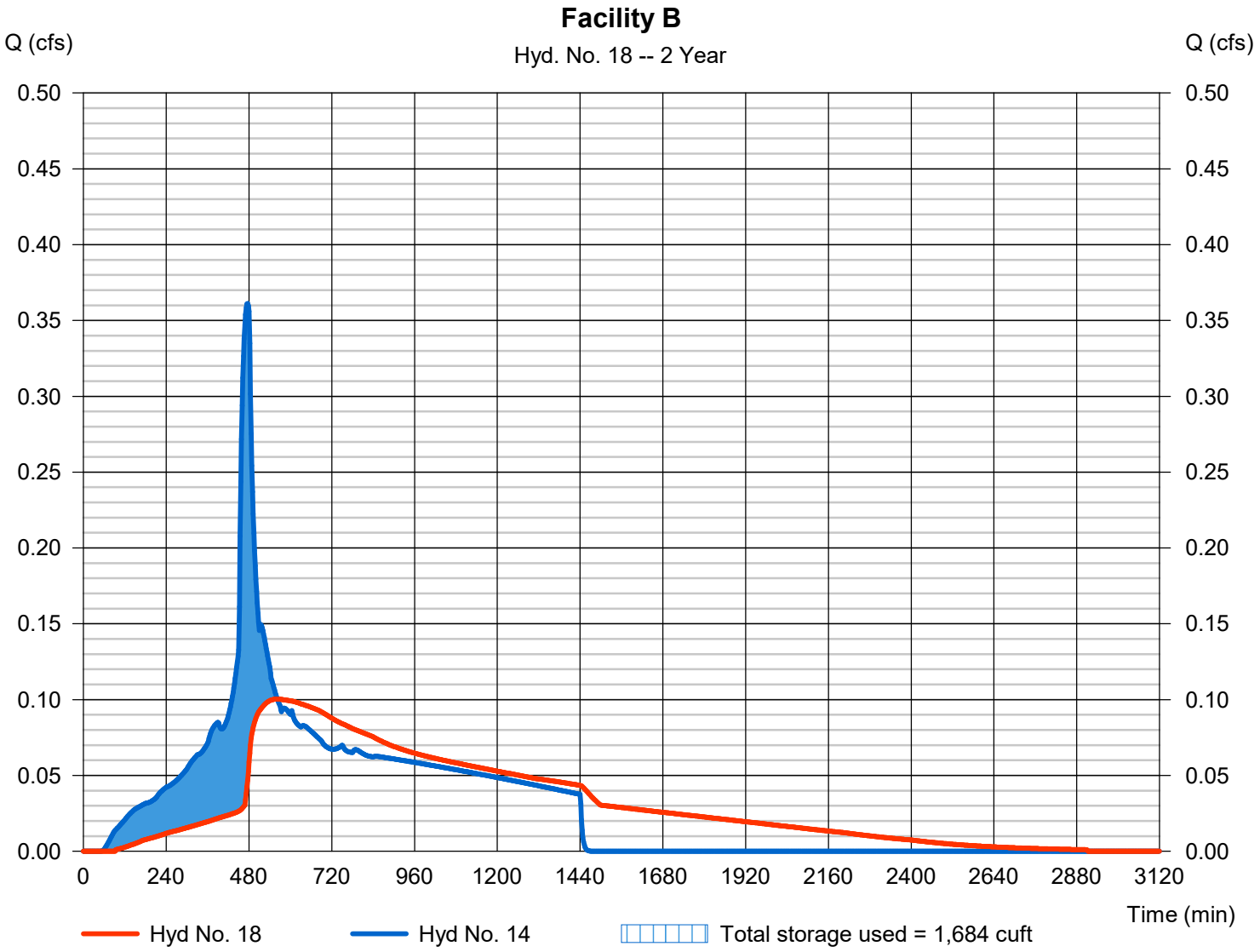
Hydrograph Report

Hyd. No. 18

Facility B

Hydrograph type	=	Reservoir	Peak discharge	=	0.100 cfs
Storm frequency	=	2 yrs	Time to peak	=	562 min
Time interval	=	2 min	Hyd. volume	=	5,573 cuft
Inflow hyd. No.	=	14 - Basin B Post-Developed	Max. Elevation	=	173.85 ft
Reservoir name	=	Extended Dry Basin B	Max. Storage	=	1,684 cuft

Storage Indication method used.



Pond Report

Pond No. 3 - Extended Dry Basin B

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 172.50 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	172.50	925	0	0
1.00	173.50	1,344	1,128	1,128
2.00	174.50	1,820	1,576	2,704
3.00	175.50	2,352	2,080	4,784

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 12.00	1.10	2.20	0.00
Span (in)	= 12.00	1.10	2.20	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 172.50	172.50	173.50	0.00
Length (ft)	= 50.00	0.00	0.00	0.00
Slope (%)	= 1.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 4.71	0.00	0.00	0.00
Crest El. (ft)	= 174.50	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	172.50	0.00	0.00	0.00	---	0.00	---	---	---	---	---	0.000
1.00	1,128	173.50	0.03 ic	0.03 ic	0.00	---	0.00	---	---	---	---	---	0.030
2.00	2,704	174.50	0.04 ic	0.04 ic	0.12 ic	---	0.00	---	---	---	---	---	0.165
3.00	4,784	175.50	0.06 ic	0.05 ic	0.18 ic	---	15.68	---	---	---	---	---	15.91

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

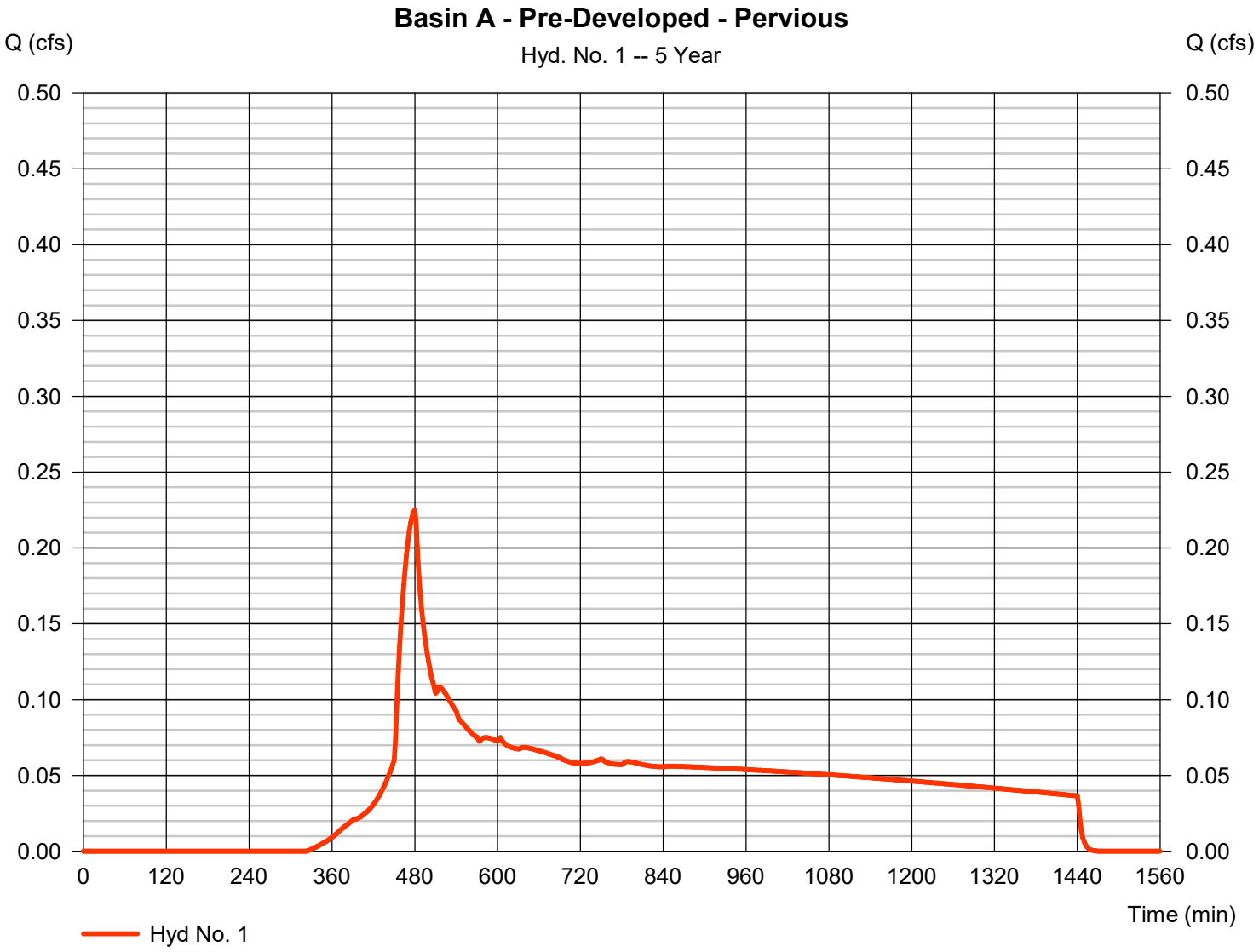
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SBUH Runoff	0.225	2	480	3,812	------	------	------	Basin A - Pre-Developed - Pervious
2	SBUH Runoff	0.222	2	474	3,206	------	------	------	Basin A - Pre-Developed - Impervious
3	Combine	0.443	2	478	7,018	1, 2	------	------	Basin A Pre-Developed
4	SBUH Runoff	0.221	2	480	3,748	------	------	------	Basin B - Pre-Developed - Pervious
5	SBUH Runoff	0.098	2	474	1,416	------	------	------	Basin B - Pre-Developed - Impervious
6	Combine	0.317	2	478	5,163	4, 5	------	------	Basin B Pre-Developed
8	SBUH Runoff	0.055	2	480	1,091	------	------	------	Basin A - Post-Developed - Pervious
9	SBUH Runoff	0.600	2	474	8,651	------	------	------	Basin A - Post-Developed - Imperviou
10	Combine	0.651	2	474	9,742	8, 9	------	------	Basin A Post-Developed
12	SBUH Runoff	0.067	2	480	1,331	------	------	------	Basin B - Post-Developed - Pervious
13	SBUH Runoff	0.417	2	474	6,007	------	------	------	Basin B - Post-Developed - Imperviou
14	Combine	0.479	2	476	7,337	12, 13	------	------	Basin B Post-Developed
16	Reservoir	0.193	2	548	9,517	10	174.56	2,134	Facility A
18	Reservoir	0.136	2	558	7,322	14	174.16	2,175	Facility B

Hydrograph Report

Hyd. No. 1

Basin A - Pre-Developed - Pervious

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.225 cfs
Storm frequency	= 5 yrs	Time to peak	= 480 min
Time interval	= 2 min	Hyd. volume	= 3,812 cuft
Drainage area	= 0.832 ac	Curve number	= 79
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.10 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

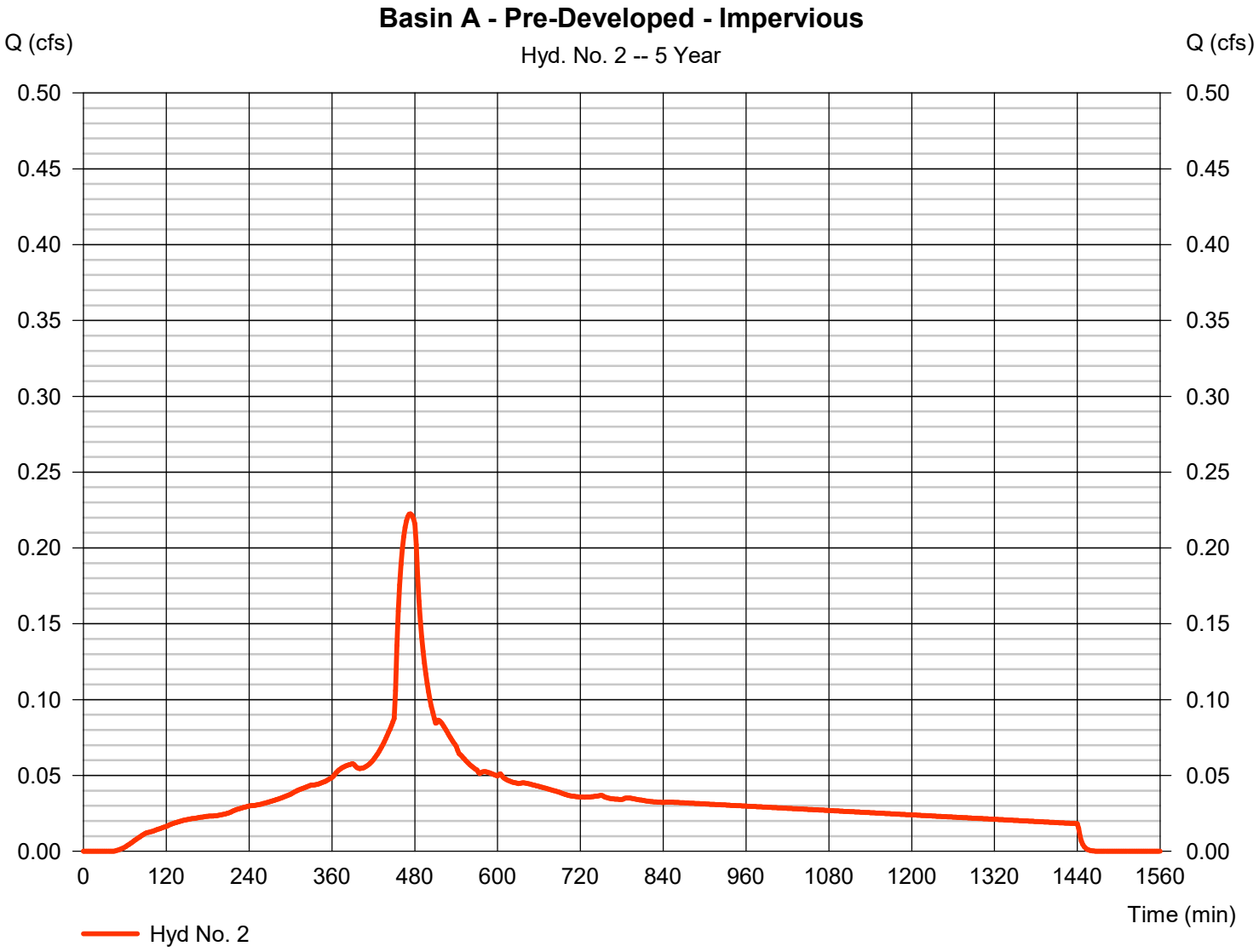


Hydrograph Report

Hyd. No. 2

Basin A - Pre-Developed - Impervious

Hydrograph type	=	SBUH Runoff	Peak discharge	=	0.222 cfs
Storm frequency	=	5 yrs	Time to peak	=	474 min
Time interval	=	2 min	Hyd. volume	=	3,206 cuft
Drainage area	=	0.308 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	3.10 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a

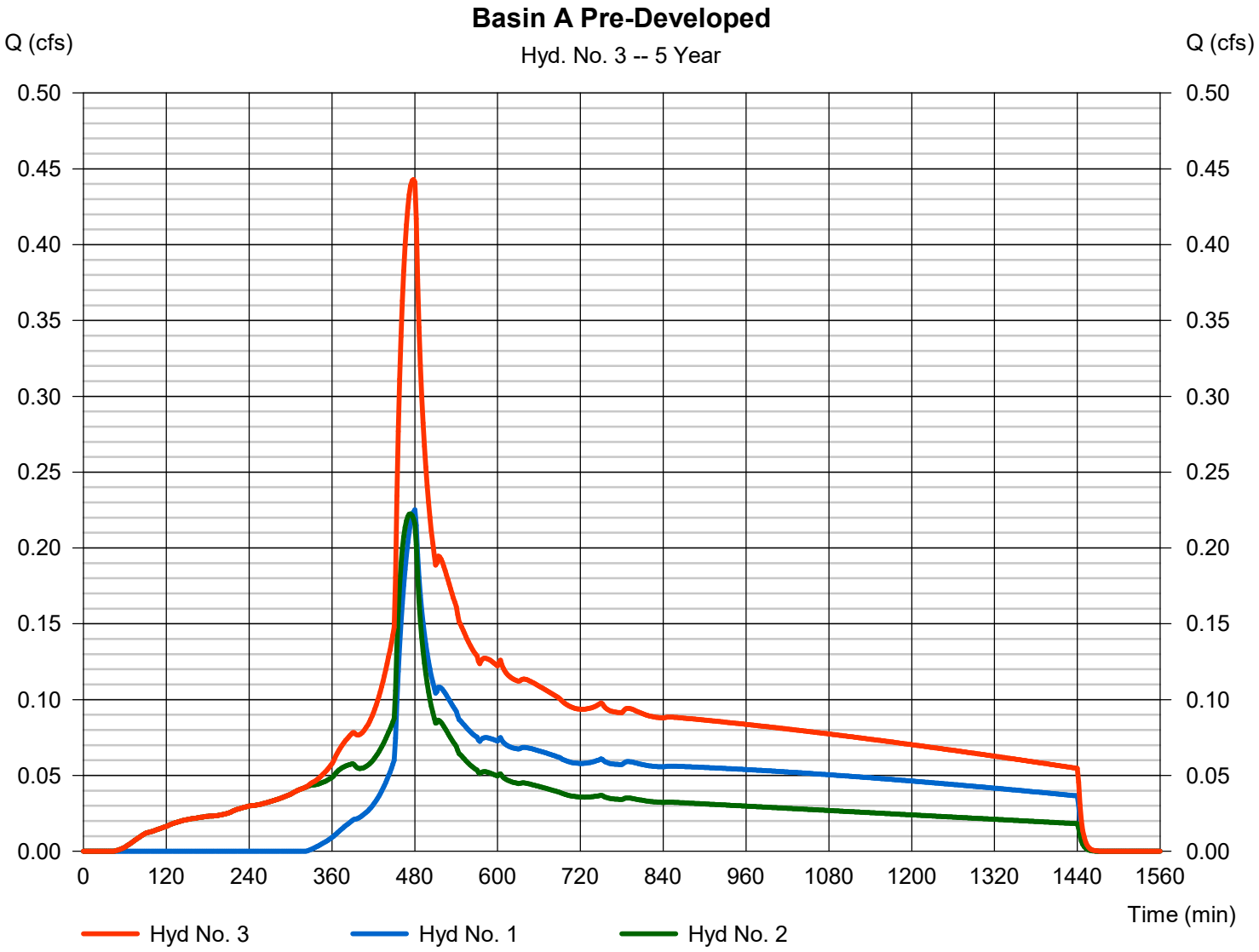


Hydrograph Report

Hyd. No. 3

Basin A Pre-Developed

Hydrograph type	=	Combine	Peak discharge	=	0.443 cfs
Storm frequency	=	5 yrs	Time to peak	=	478 min
Time interval	=	2 min	Hyd. volume	=	7,018 cuft
Inflow hyds.	=	1, 2	Contrib. drain. area	=	1.140 ac

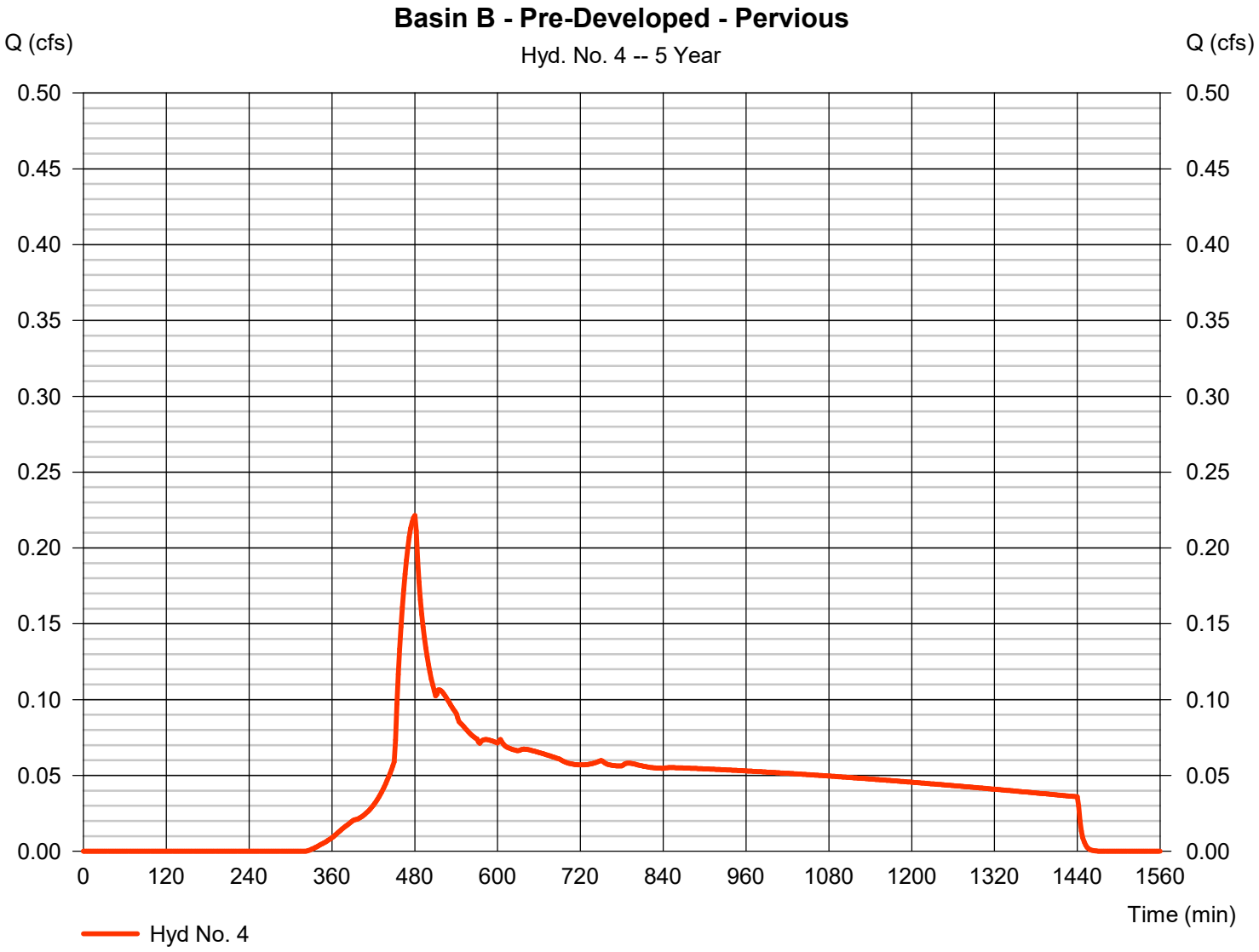


Hydrograph Report

Hyd. No. 4

Basin B - Pre-Developed - Pervious

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.221 cfs
Storm frequency	= 5 yrs	Time to peak	= 480 min
Time interval	= 2 min	Hyd. volume	= 3,748 cuft
Drainage area	= 0.818 ac	Curve number	= 79
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.10 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

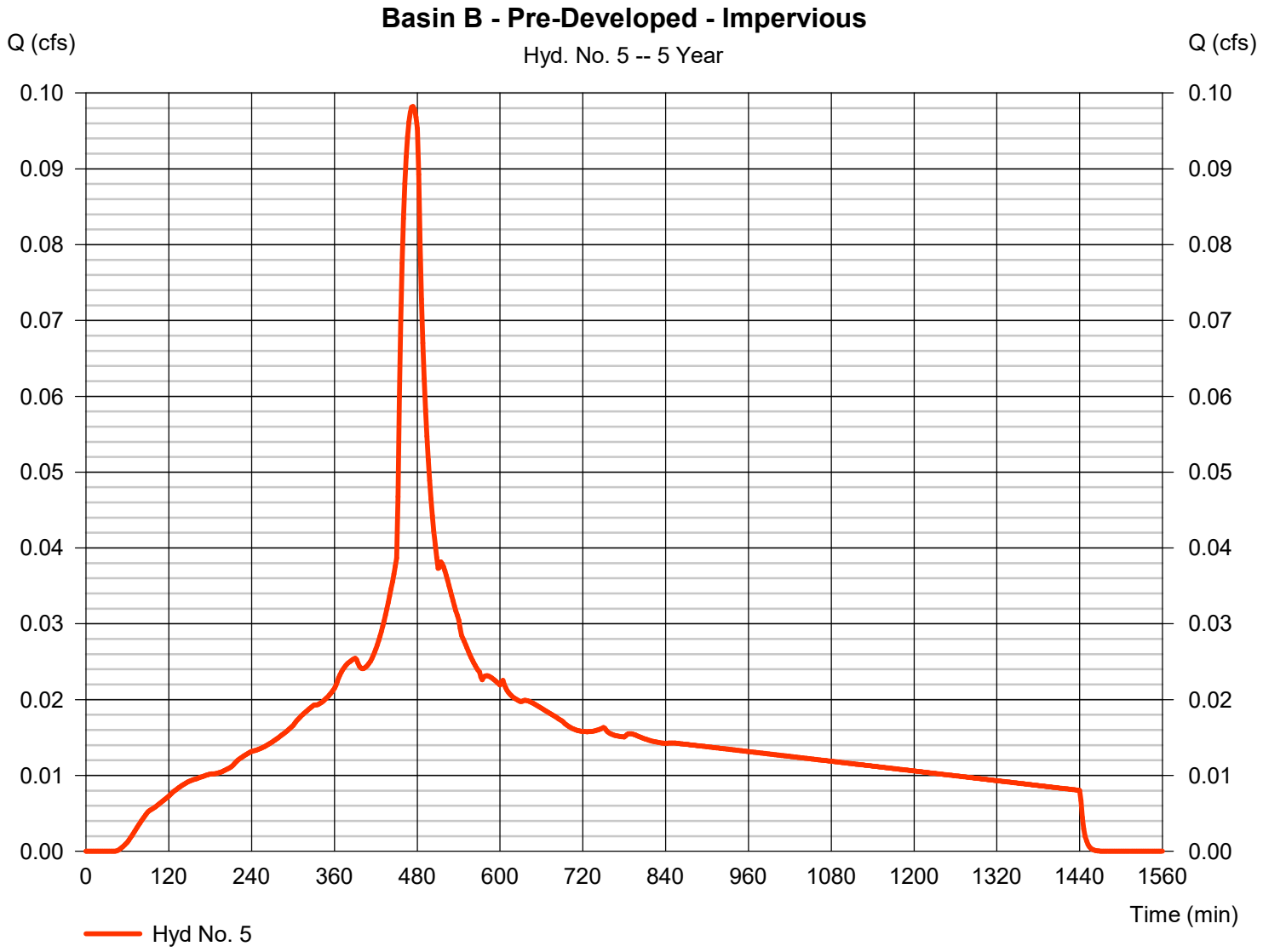


Hydrograph Report

Hyd. No. 5

Basin B - Pre-Developed - Impervious

Hydrograph type	=	SBUH Runoff	Peak discharge	=	0.098 cfs
Storm frequency	=	5 yrs	Time to peak	=	474 min
Time interval	=	2 min	Hyd. volume	=	1,416 cuft
Drainage area	=	0.136 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	3.10 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a

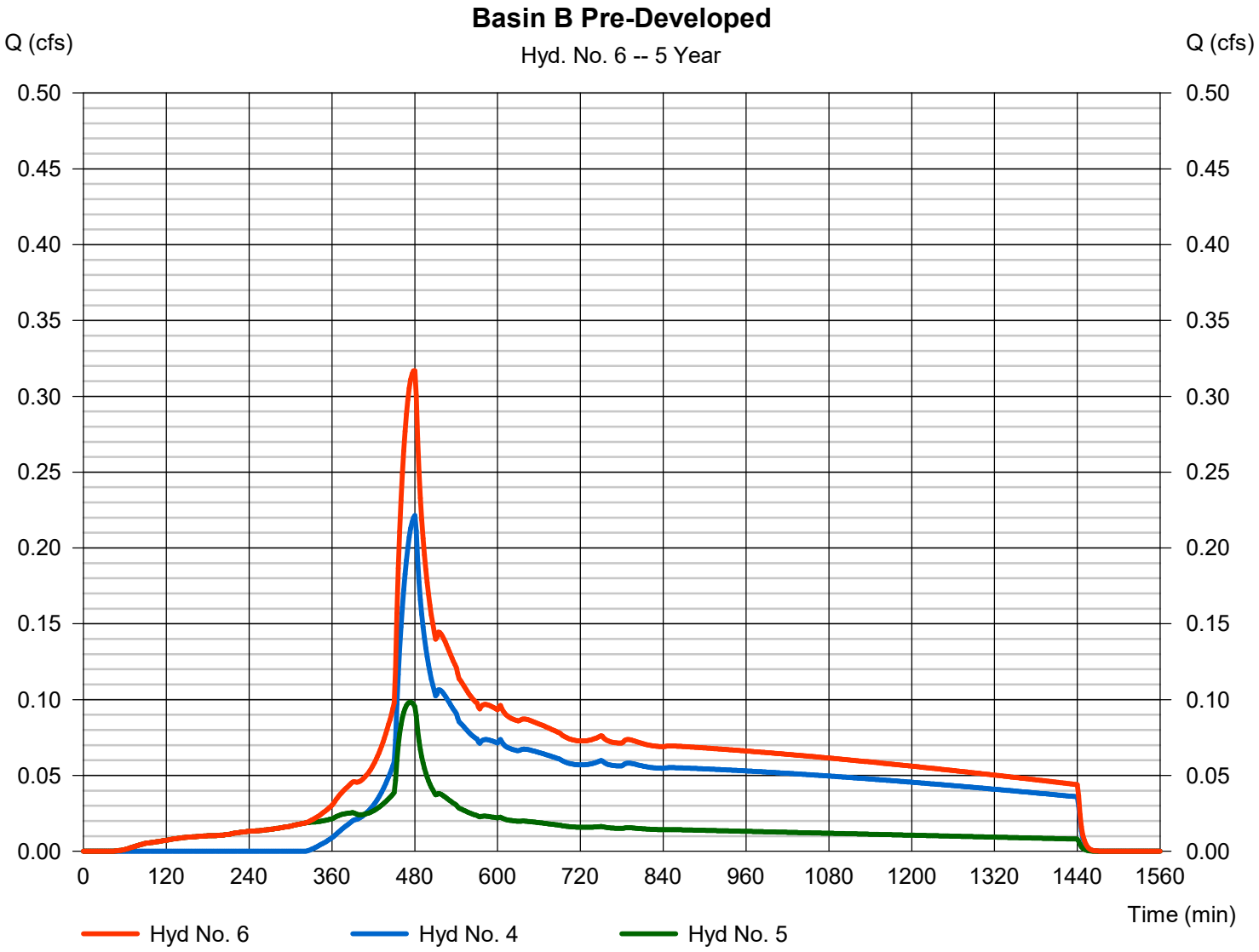


Hydrograph Report

Hyd. No. 6

Basin B Pre-Developed

Hydrograph type	= Combine	Peak discharge	= 0.317 cfs
Storm frequency	= 5 yrs	Time to peak	= 478 min
Time interval	= 2 min	Hyd. volume	= 5,163 cuft
Inflow hyds.	= 4, 5	Contrib. drain. area	= 0.954 ac

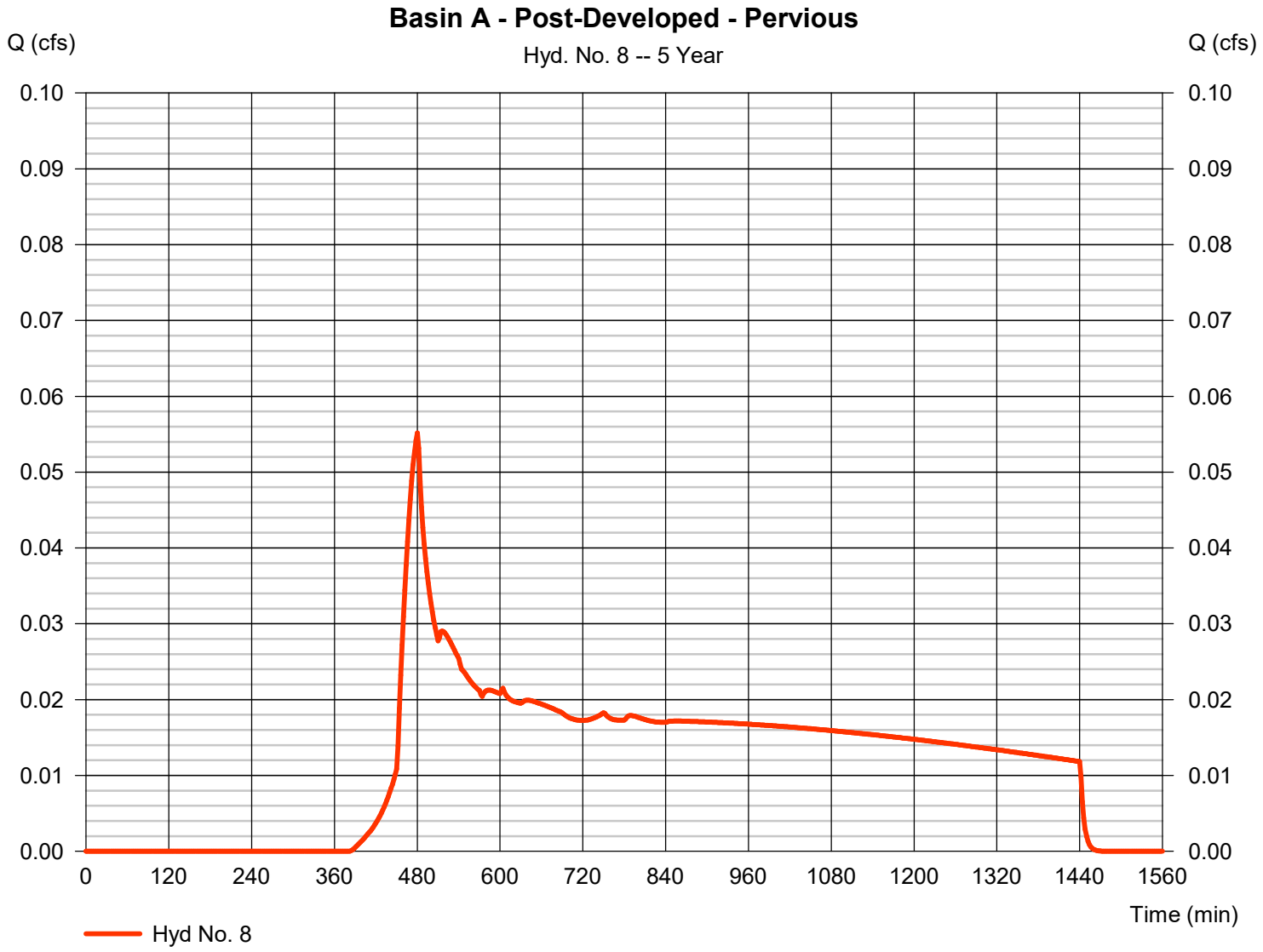


Hydrograph Report

Hyd. No. 8

Basin A - Post-Developed - Pervious

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.055 cfs
Storm frequency	= 5 yrs	Time to peak	= 480 min
Time interval	= 2 min	Hyd. volume	= 1,091 cuft
Drainage area	= 0.309 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.10 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

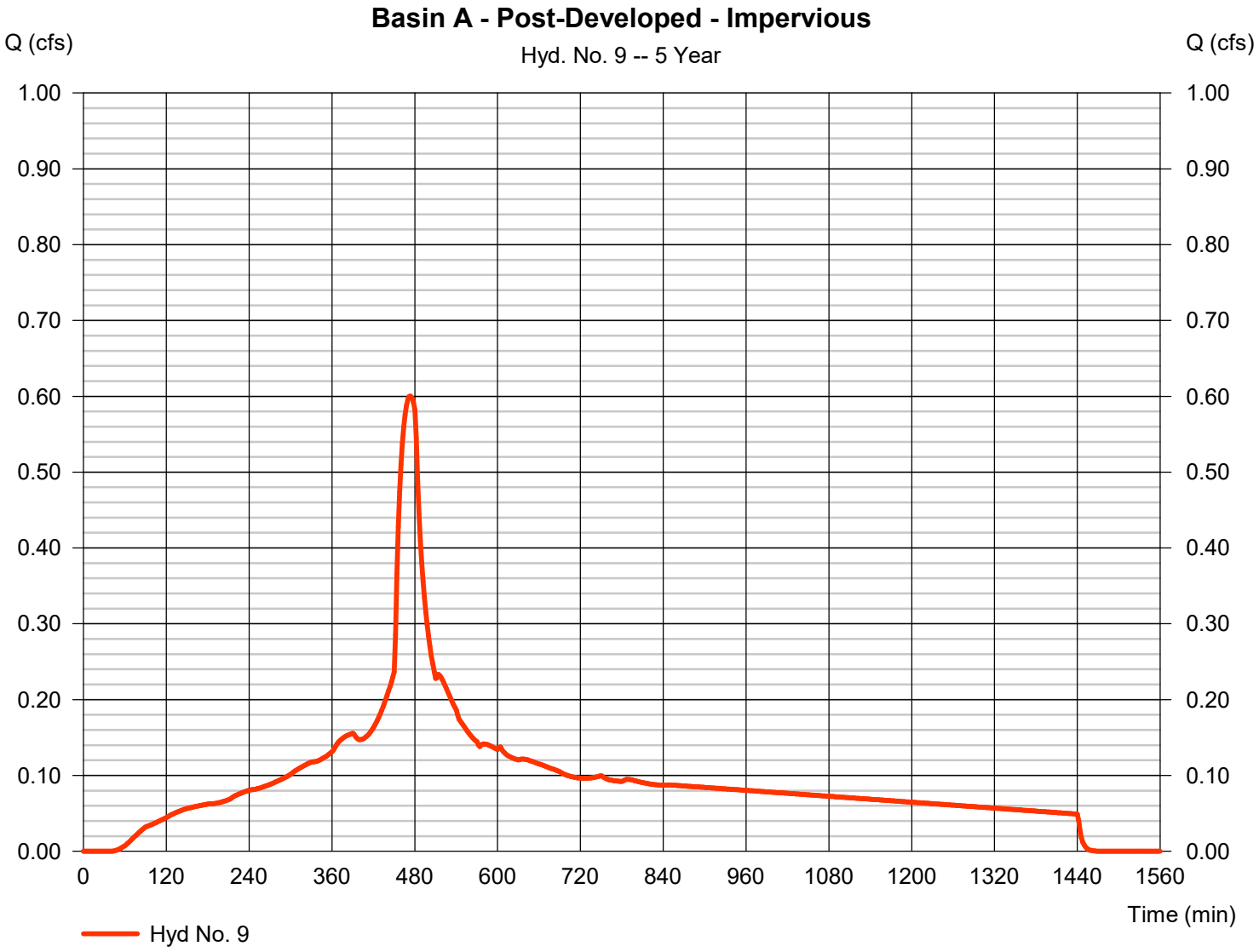


Hydrograph Report

Hyd. No. 9

Basin A - Post-Developed - Impervious

Hydrograph type	=	SBUH Runoff	Peak discharge	=	0.600 cfs
Storm frequency	=	5 yrs	Time to peak	=	474 min
Time interval	=	2 min	Hyd. volume	=	8,651 cuft
Drainage area	=	0.831 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	3.10 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a

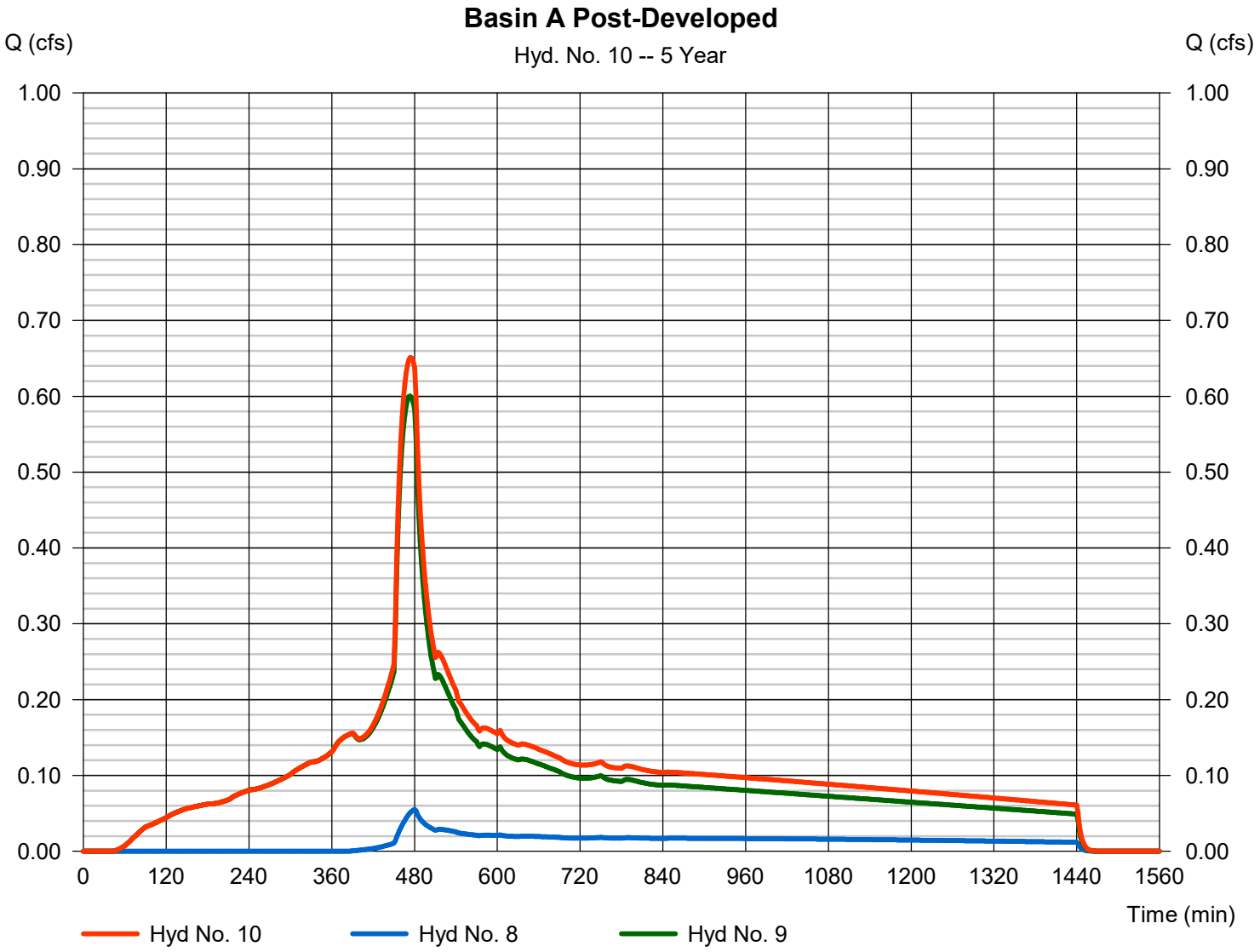


Hydrograph Report

Hyd. No. 10

Basin A Post-Developed

Hydrograph type	=	Combine	Peak discharge	=	0.651 cfs
Storm frequency	=	5 yrs	Time to peak	=	474 min
Time interval	=	2 min	Hyd. volume	=	9,742 cuft
Inflow hyds.	=	8, 9	Contrib. drain. area	=	1.140 ac

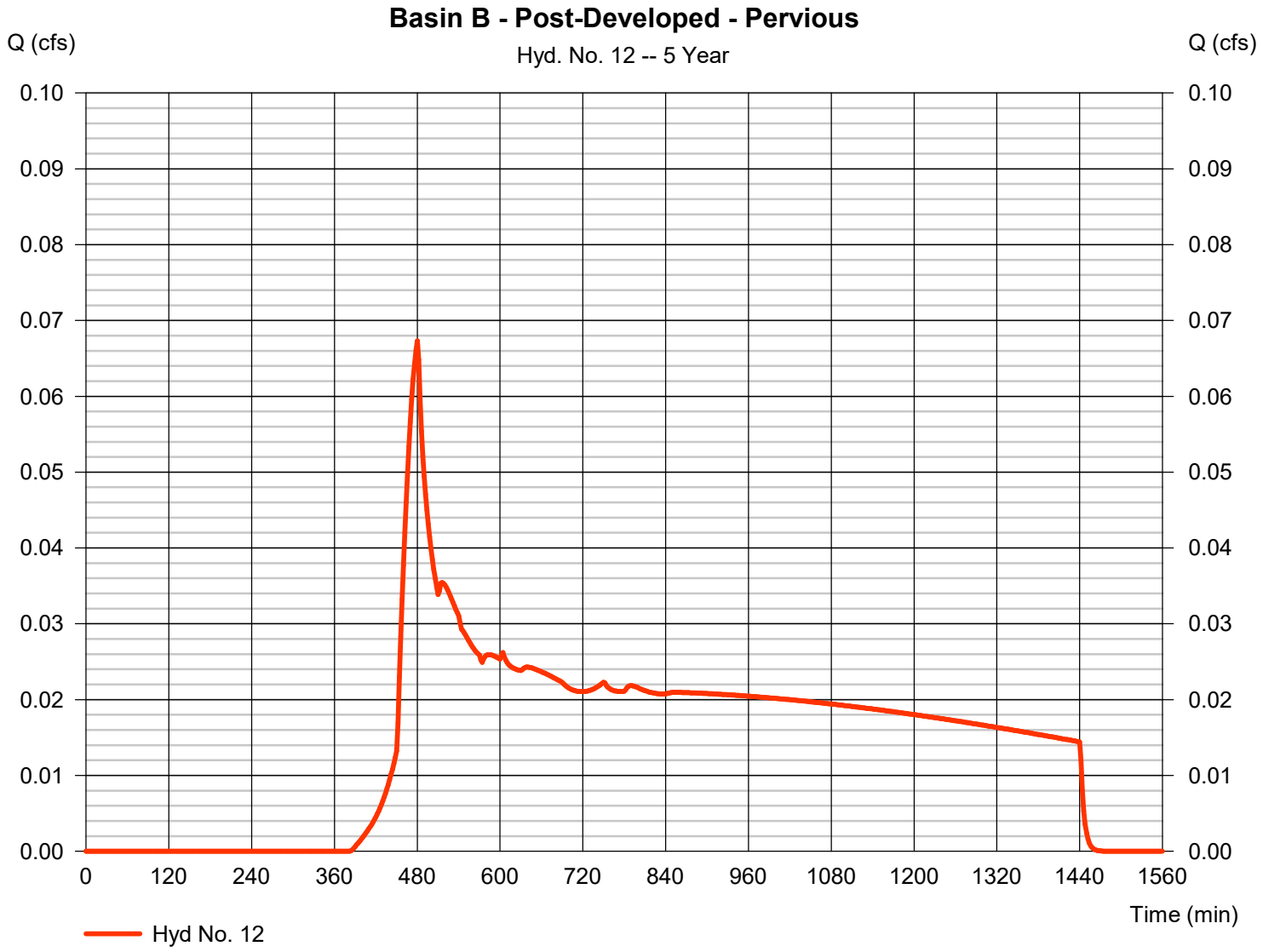


Hydrograph Report

Hyd. No. 12

Basin B - Post-Developed - Pervious

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.067 cfs
Storm frequency	= 5 yrs	Time to peak	= 480 min
Time interval	= 2 min	Hyd. volume	= 1,331 cuft
Drainage area	= 0.377 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.10 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

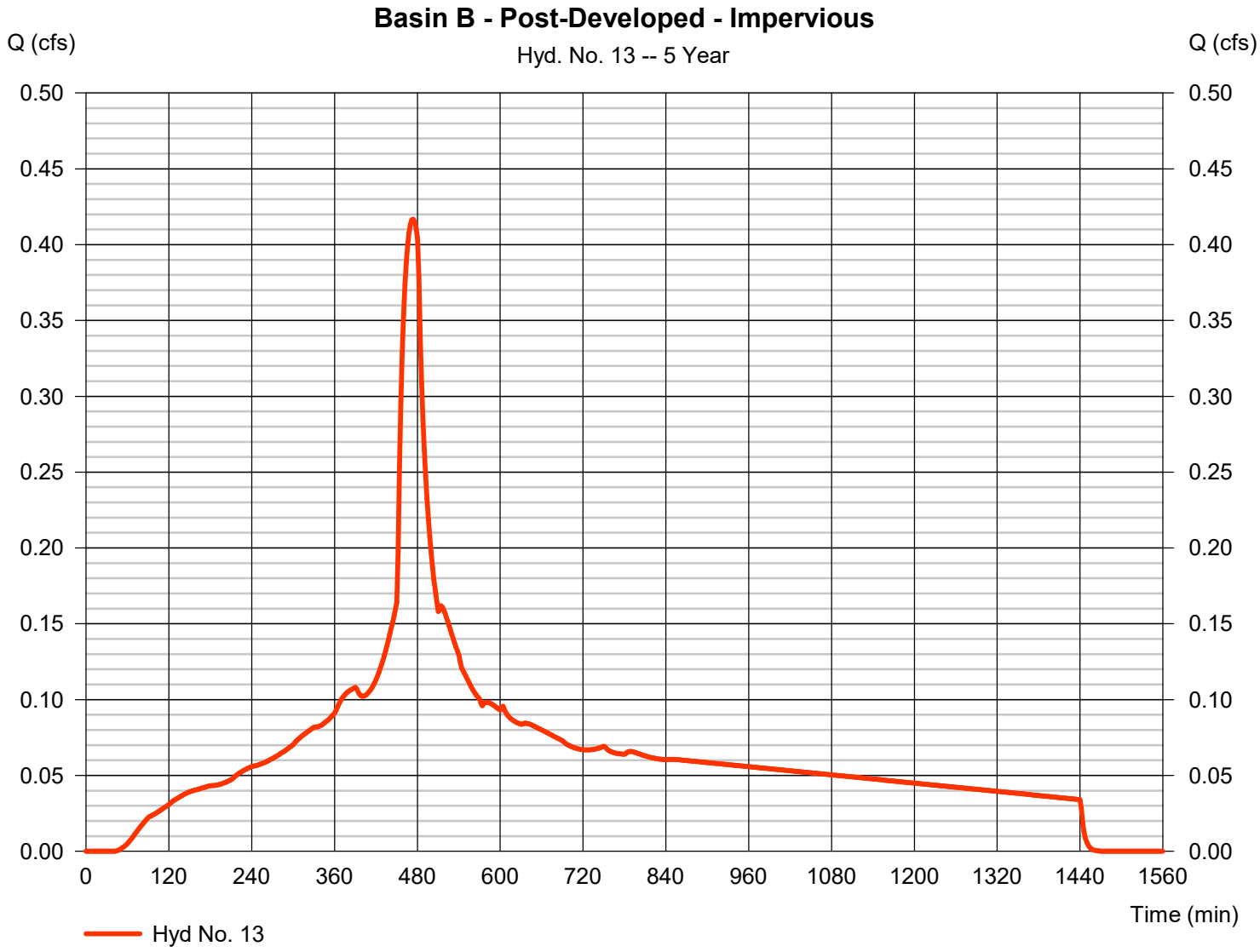


Hydrograph Report

Hyd. No. 13

Basin B - Post-Developed - Impervious

Hydrograph type	=	SBUH Runoff	Peak discharge	=	0.417 cfs
Storm frequency	=	5 yrs	Time to peak	=	474 min
Time interval	=	2 min	Hyd. volume	=	6,007 cuft
Drainage area	=	0.577 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	3.10 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a

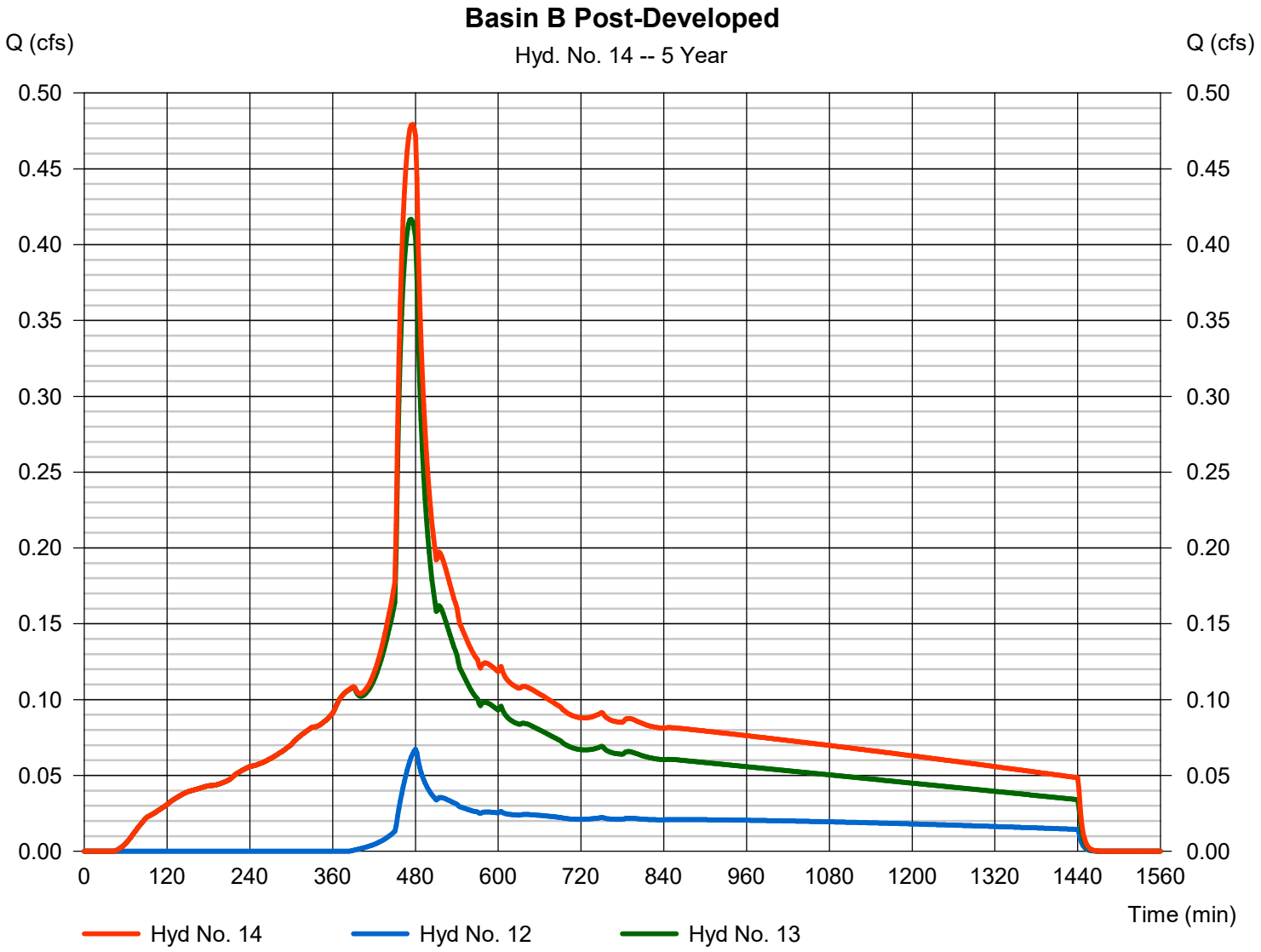


Hydrograph Report

Hyd. No. 14

Basin B Post-Developed

Hydrograph type	=	Combine	Peak discharge	=	0.479 cfs
Storm frequency	=	5 yrs	Time to peak	=	476 min
Time interval	=	2 min	Hyd. volume	=	7,337 cuft
Inflow hyds.	=	12, 13	Contrib. drain. area	=	0.954 ac



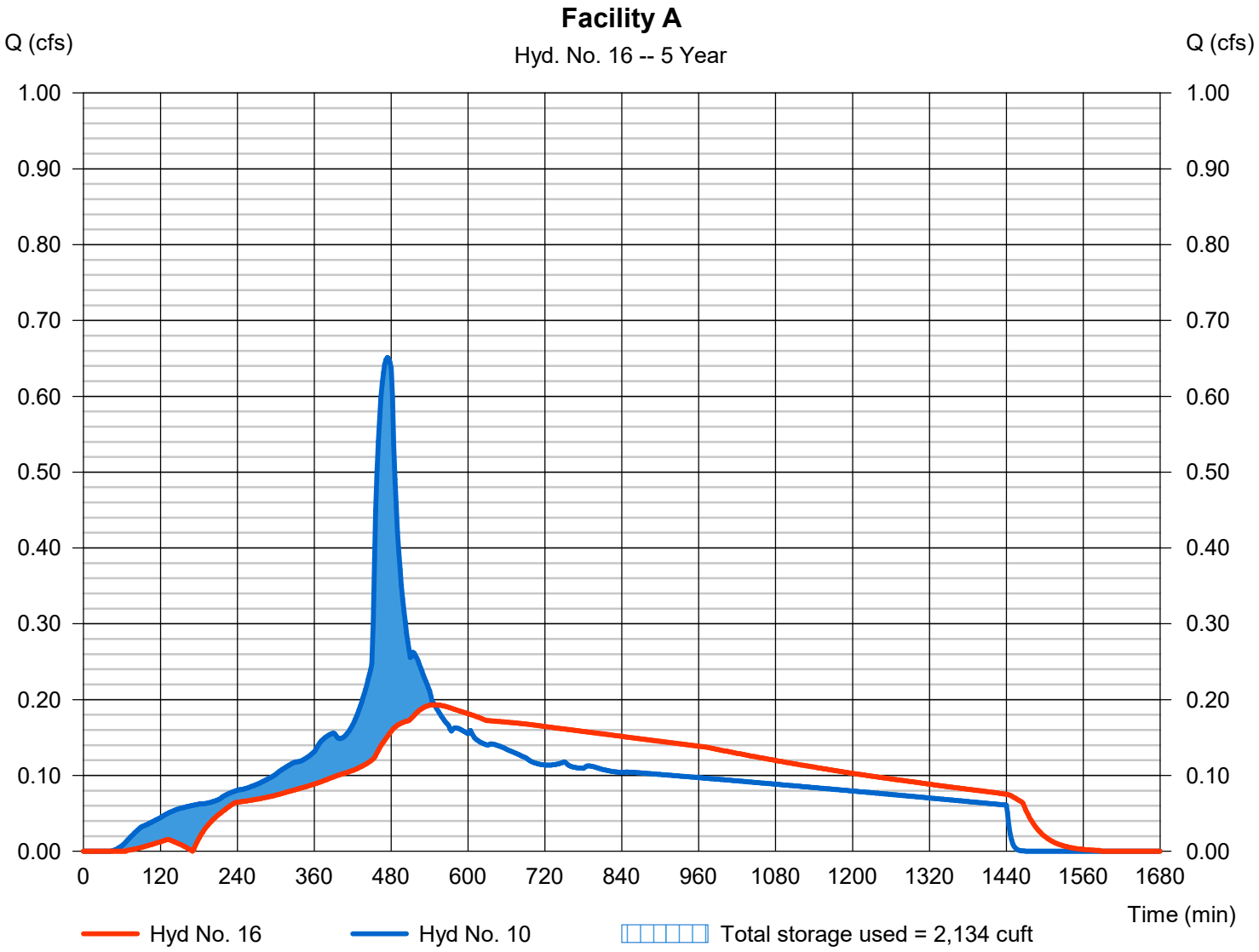
Hydrograph Report

Hyd. No. 16

Facility A

Hydrograph type	=	Reservoir	Peak discharge	=	0.193 cfs
Storm frequency	=	5 yrs	Time to peak	=	548 min
Time interval	=	2 min	Hyd. volume	=	9,517 cuft
Inflow hyd. No.	=	10 - Basin A Post-Developed	Max. Elevation	=	174.56 ft
Reservoir name	=	Extended Dry Basin A	Max. Storage	=	2,134 cuft

Storage Indication method used.



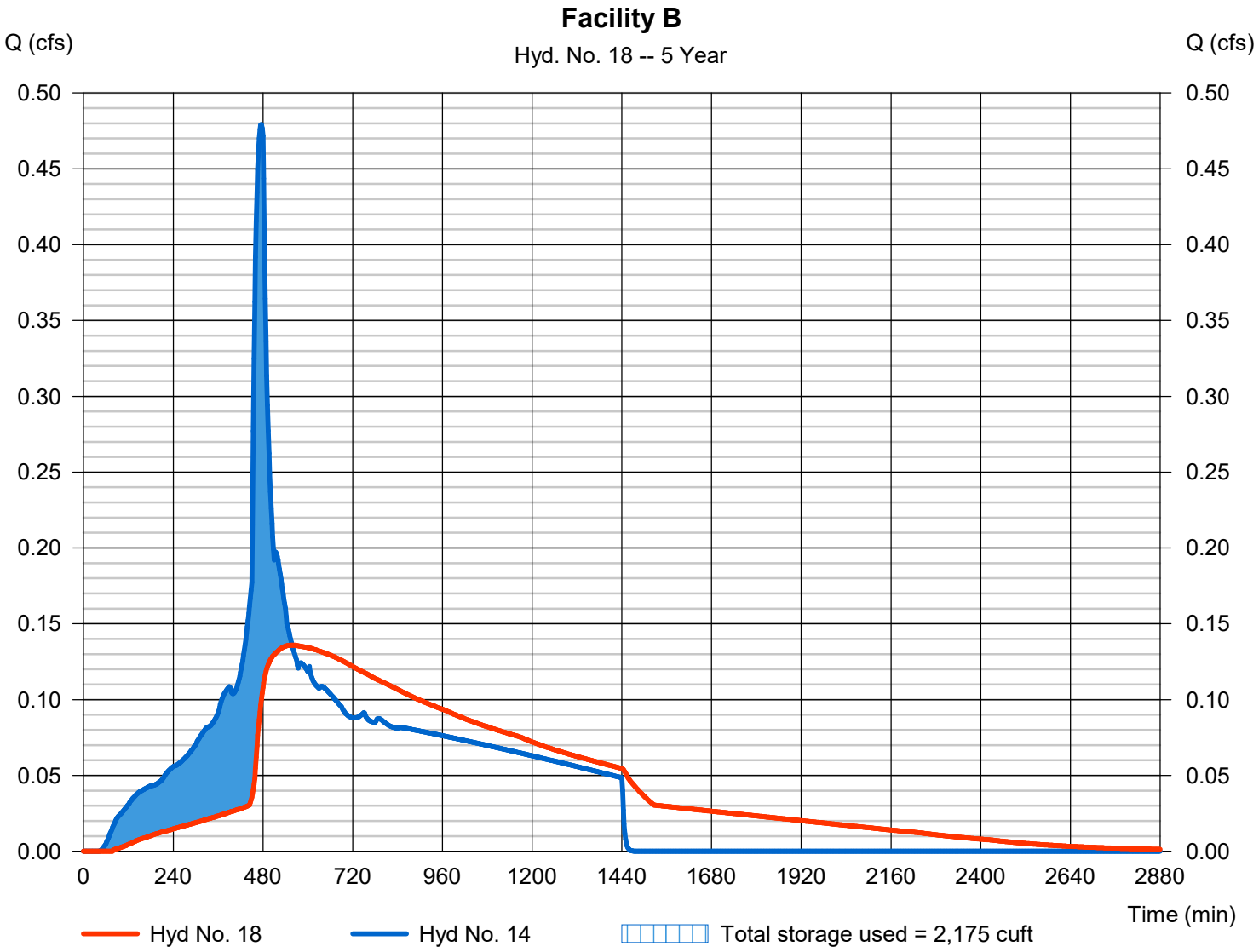
Hydrograph Report

Hyd. No. 18

Facility B

Hydrograph type	=	Reservoir	Peak discharge	=	0.136 cfs
Storm frequency	=	5 yrs	Time to peak	=	558 min
Time interval	=	2 min	Hyd. volume	=	7,322 cuft
Inflow hyd. No.	=	14 - Basin B Post-Developed	Max. Elevation	=	174.16 ft
Reservoir name	=	Extended Dry Basin B	Max. Storage	=	2,175 cuft

Storage Indication method used.



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SBUH Runoff	0.283	2	480	4,613	------	------	------	Basin A - Pre-Developed - Pervious
2	SBUH Runoff	0.249	2	474	3,596	------	------	------	Basin A - Pre-Developed - Impervious
3	Combine	0.527	2	478	8,209	1, 2	------	------	Basin A Pre-Developed
4	SBUH Runoff	0.278	2	480	4,535	------	------	------	Basin B - Pre-Developed - Pervious
5	SBUH Runoff	0.110	2	474	1,588	------	------	------	Basin B - Pre-Developed - Impervious
6	Combine	0.385	2	478	6,123	4, 5	------	------	Basin B Pre-Developed
8	SBUH Runoff	0.074	2	480	1,352	------	------	------	Basin A - Post-Developed - Pervious
9	SBUH Runoff	0.671	2	474	9,703	------	------	------	Basin A - Post-Developed - Imperviou
10	Combine	0.740	2	474	11,055	8, 9	------	------	Basin A Post-Developed
12	SBUH Runoff	0.090	2	480	1,650	------	------	------	Basin B - Post-Developed - Pervious
13	SBUH Runoff	0.466	2	474	6,737	------	------	------	Basin B - Post-Developed - Imperviou
14	Combine	0.550	2	476	8,387	12, 13	------	------	Basin B Post-Developed
16	Reservoir	0.265	2	530	10,831	10	174.68	2,344	Facility A
18	Reservoir	0.154	2	560	8,372	14	174.36	2,484	Facility B

Hydrograph Report

Hyd. No. 1

Basin A - Pre-Developed - Pervious

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.283 cfs
Storm frequency	= 10 yrs	Time to peak	= 480 min
Time interval	= 2 min	Hyd. volume	= 4,613 cuft
Drainage area	= 0.832 ac	Curve number	= 79
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.45 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

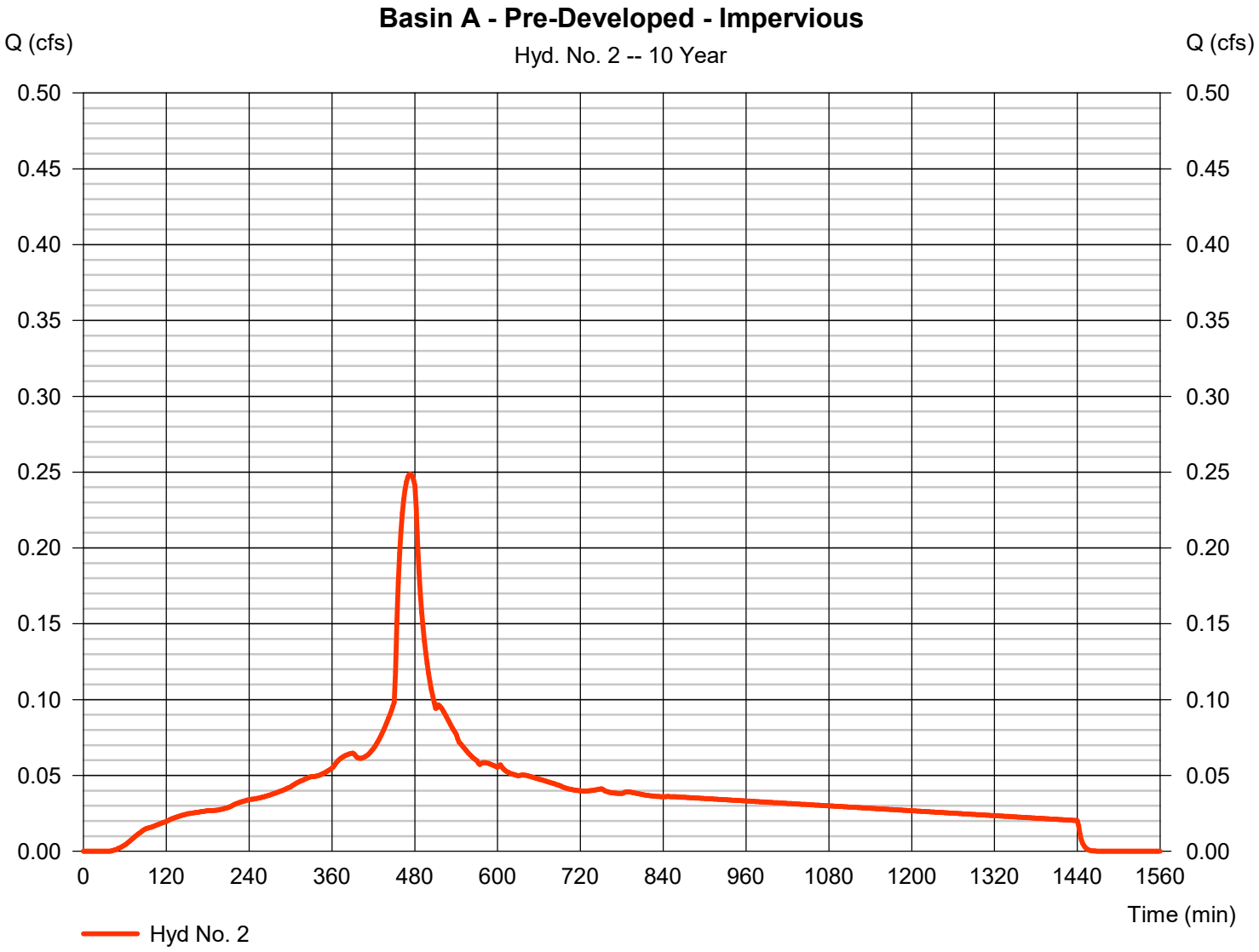


Hydrograph Report

Hyd. No. 2

Basin A - Pre-Developed - Impervious

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.249 cfs
Storm frequency	= 10 yrs	Time to peak	= 474 min
Time interval	= 2 min	Hyd. volume	= 3,596 cuft
Drainage area	= 0.308 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.45 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

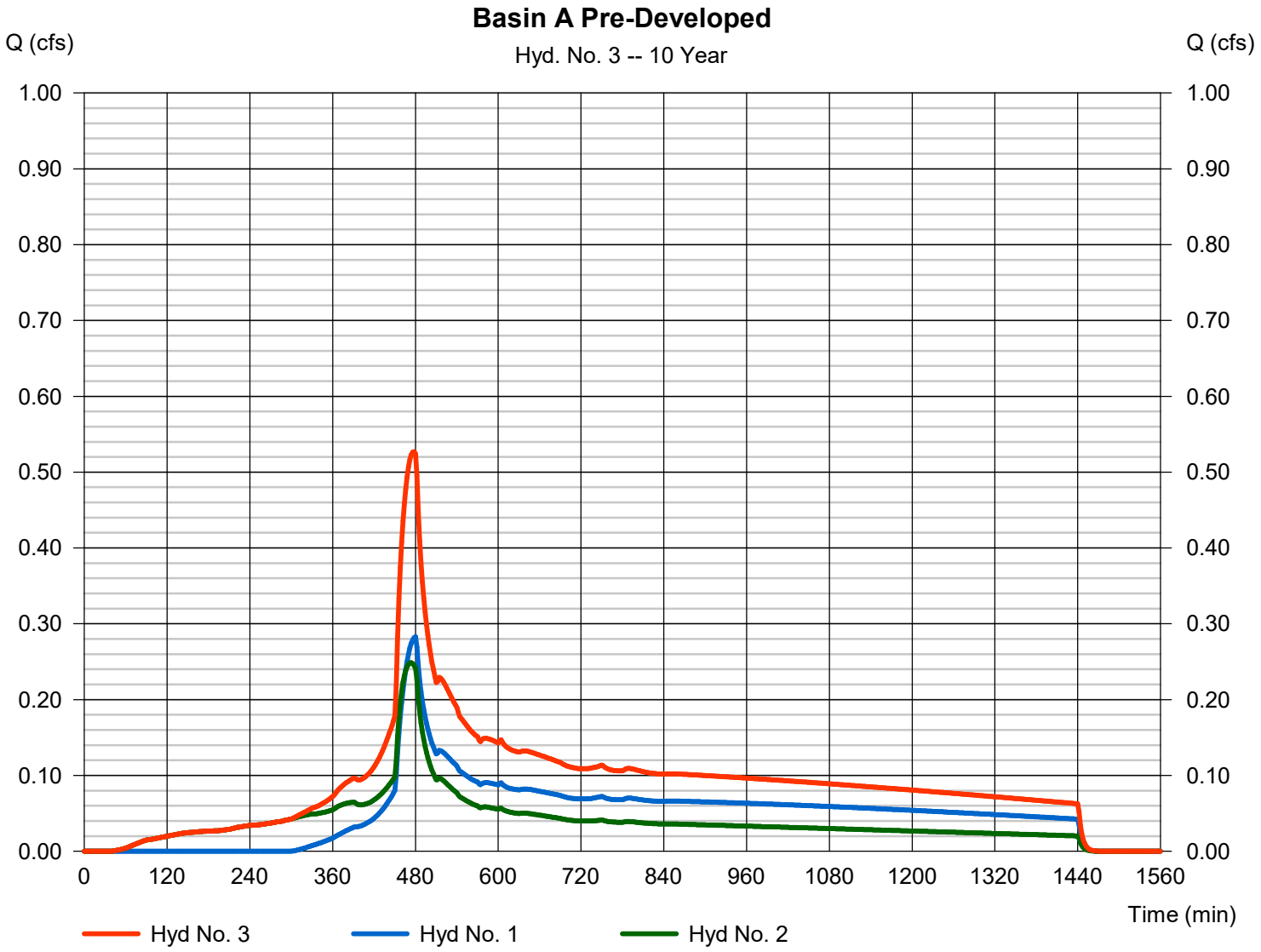


Hydrograph Report

Hyd. No. 3

Basin A Pre-Developed

Hydrograph type	=	Combine	Peak discharge	=	0.527 cfs
Storm frequency	=	10 yrs	Time to peak	=	478 min
Time interval	=	2 min	Hyd. volume	=	8,209 cuft
Inflow hyds.	=	1, 2	Contrib. drain. area	=	1.140 ac

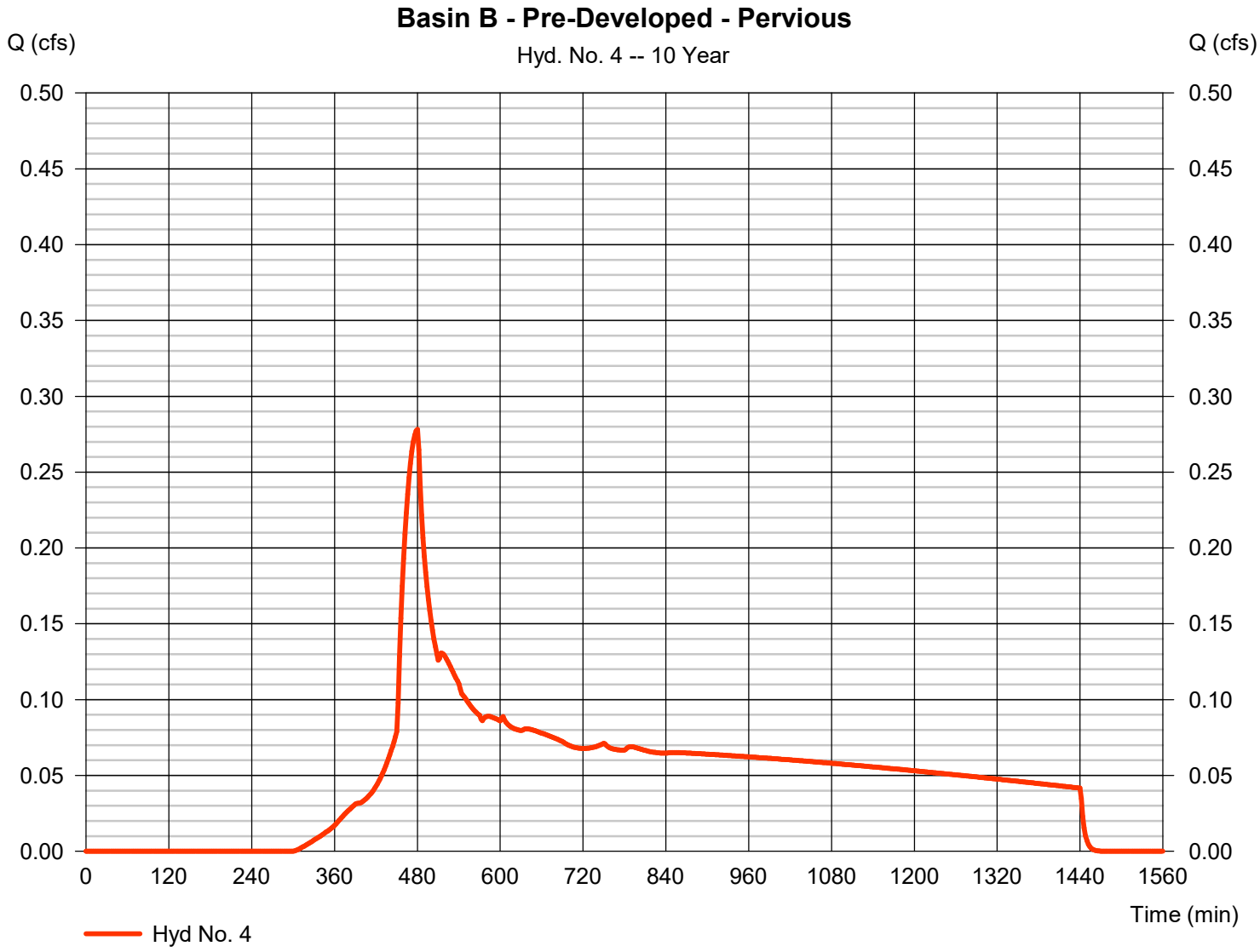


Hydrograph Report

Hyd. No. 4

Basin B - Pre-Developed - Pervious

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.278 cfs
Storm frequency	= 10 yrs	Time to peak	= 480 min
Time interval	= 2 min	Hyd. volume	= 4,535 cuft
Drainage area	= 0.818 ac	Curve number	= 79
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.45 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

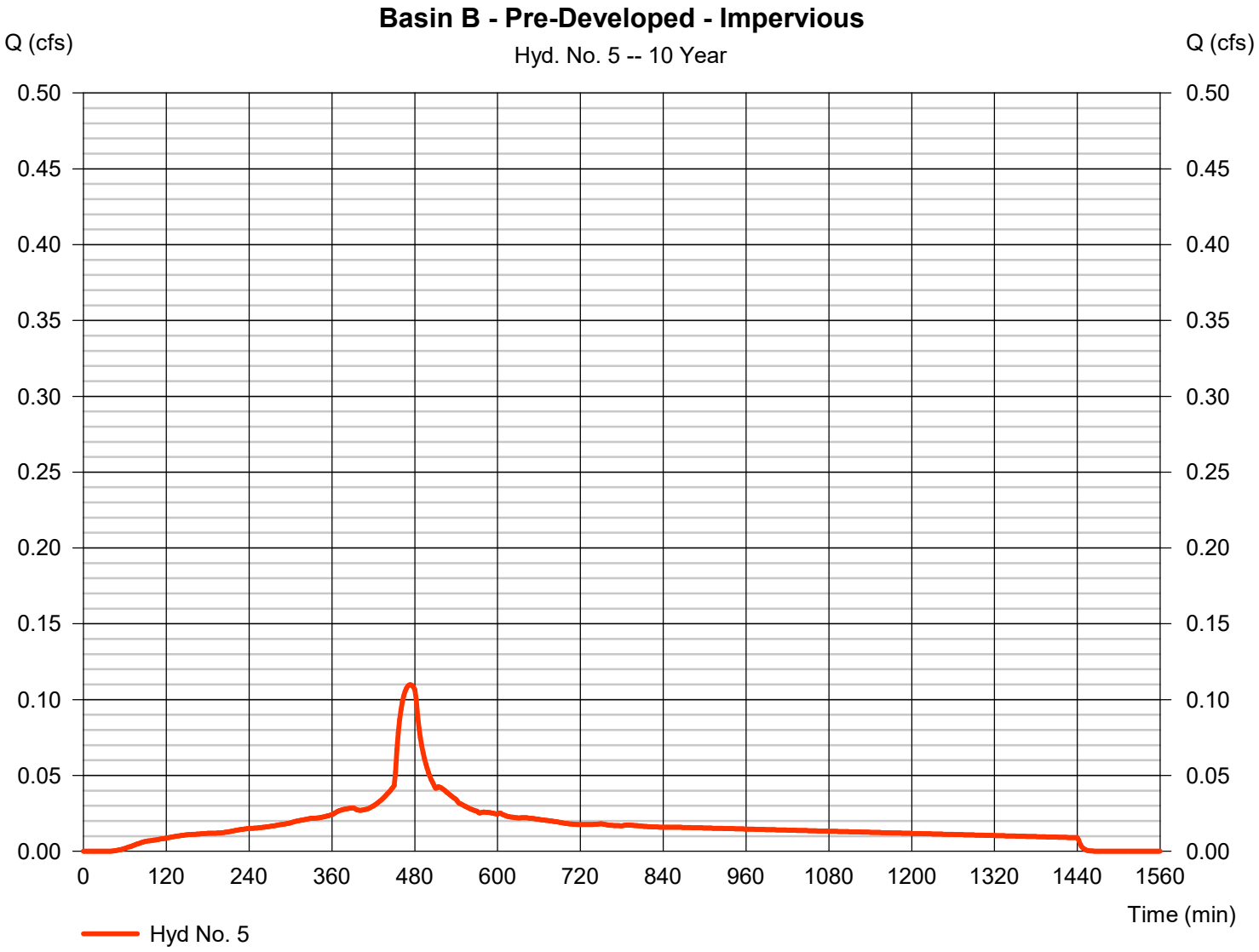


Hydrograph Report

Hyd. No. 5

Basin B - Pre-Developed - Impervious

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.110 cfs
Storm frequency	= 10 yrs	Time to peak	= 474 min
Time interval	= 2 min	Hyd. volume	= 1,588 cuft
Drainage area	= 0.136 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.45 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

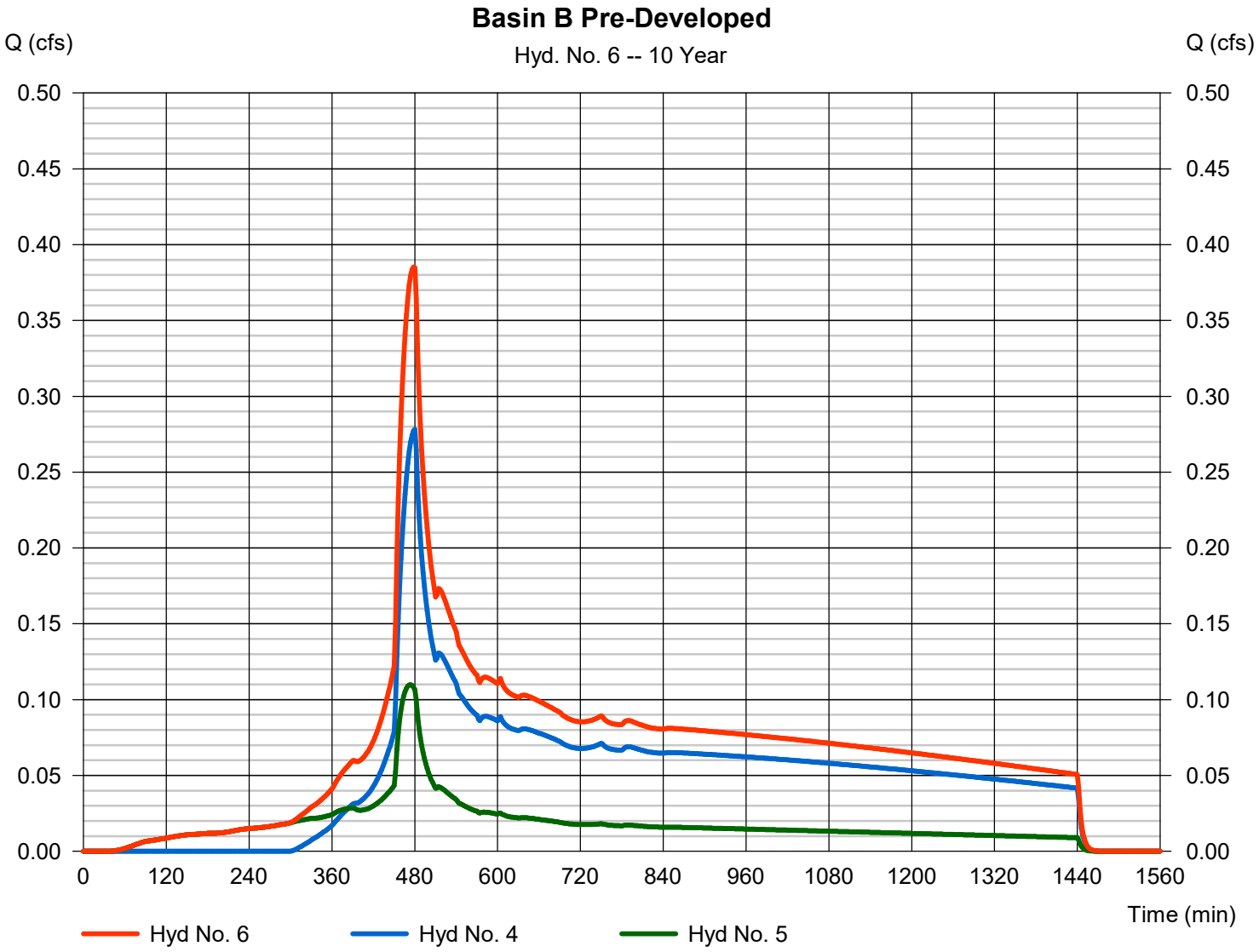


Hydrograph Report

Hyd. No. 6

Basin B Pre-Developed

Hydrograph type	= Combine	Peak discharge	= 0.385 cfs
Storm frequency	= 10 yrs	Time to peak	= 478 min
Time interval	= 2 min	Hyd. volume	= 6,123 cuft
Inflow hyds.	= 4, 5	Contrib. drain. area	= 0.954 ac

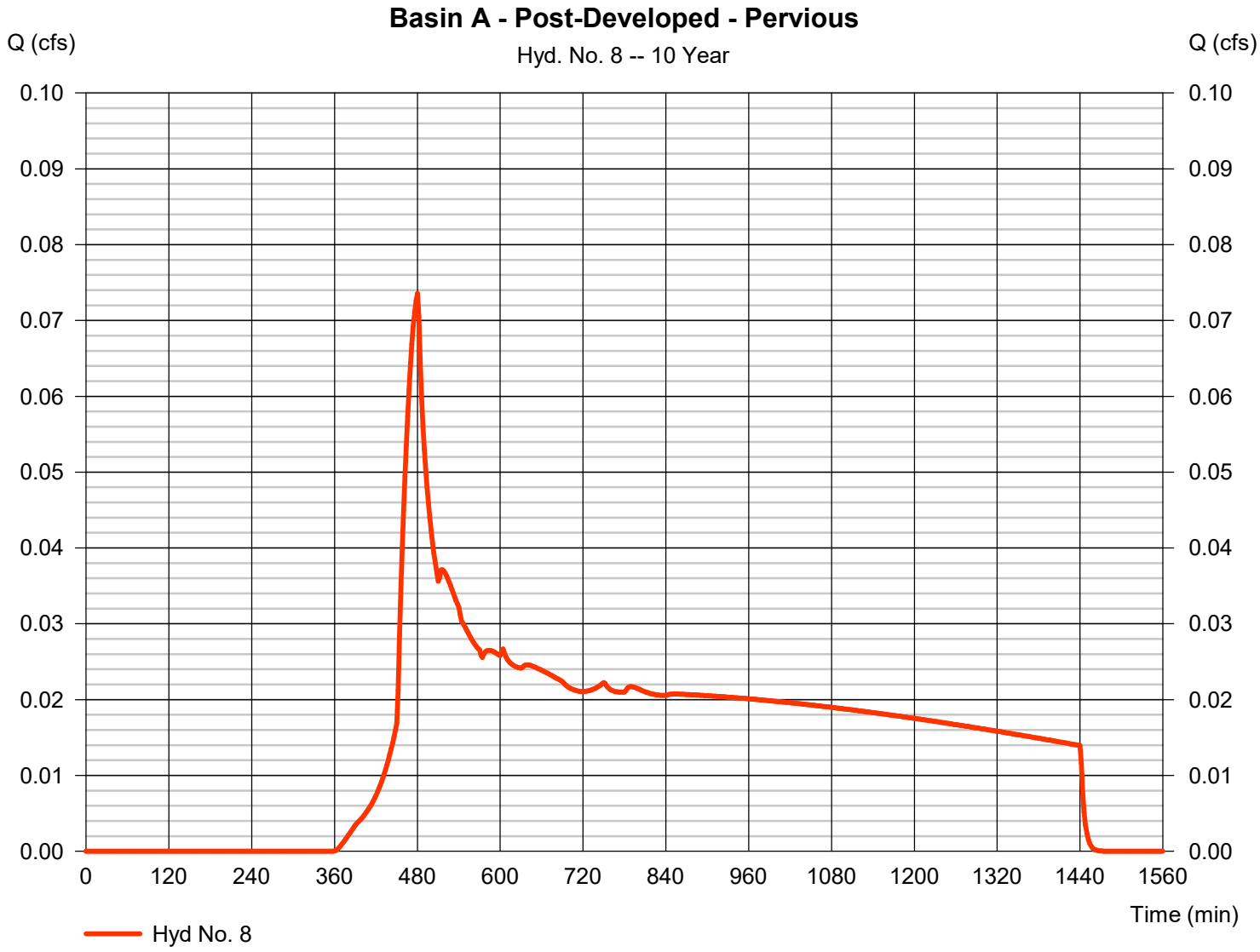


Hydrograph Report

Hyd. No. 8

Basin A - Post-Developed - Pervious

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.074 cfs
Storm frequency	= 10 yrs	Time to peak	= 480 min
Time interval	= 2 min	Hyd. volume	= 1,352 cuft
Drainage area	= 0.309 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.45 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

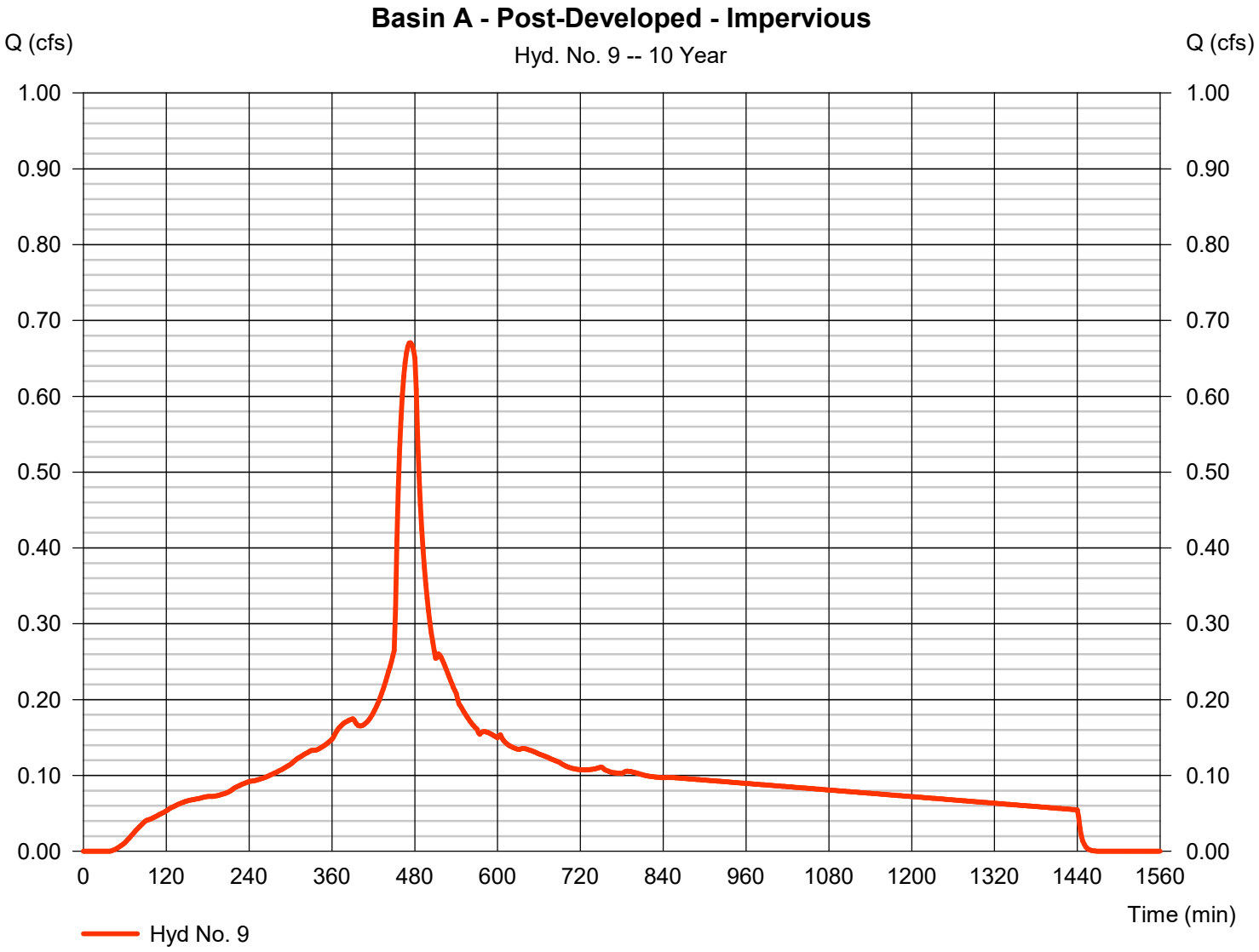


Hydrograph Report

Hyd. No. 9

Basin A - Post-Developed - Impervious

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.671 cfs
Storm frequency	= 10 yrs	Time to peak	= 474 min
Time interval	= 2 min	Hyd. volume	= 9,703 cuft
Drainage area	= 0.831 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.45 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

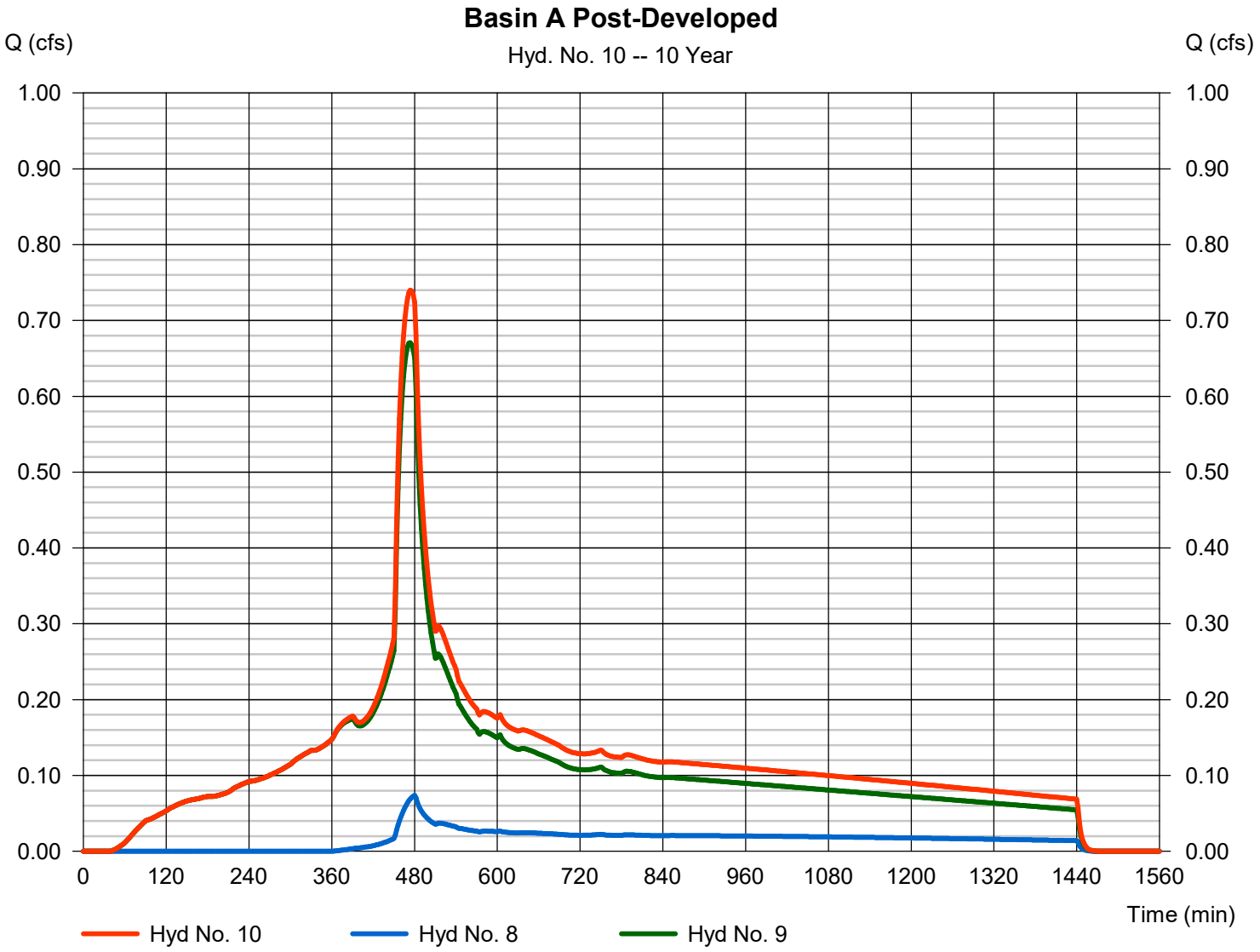


Hydrograph Report

Hyd. No. 10

Basin A Post-Developed

Hydrograph type	=	Combine	Peak discharge	=	0.740 cfs
Storm frequency	=	10 yrs	Time to peak	=	474 min
Time interval	=	2 min	Hyd. volume	=	11,055 cuft
Inflow hyds.	=	8, 9	Contrib. drain. area	=	1.140 ac

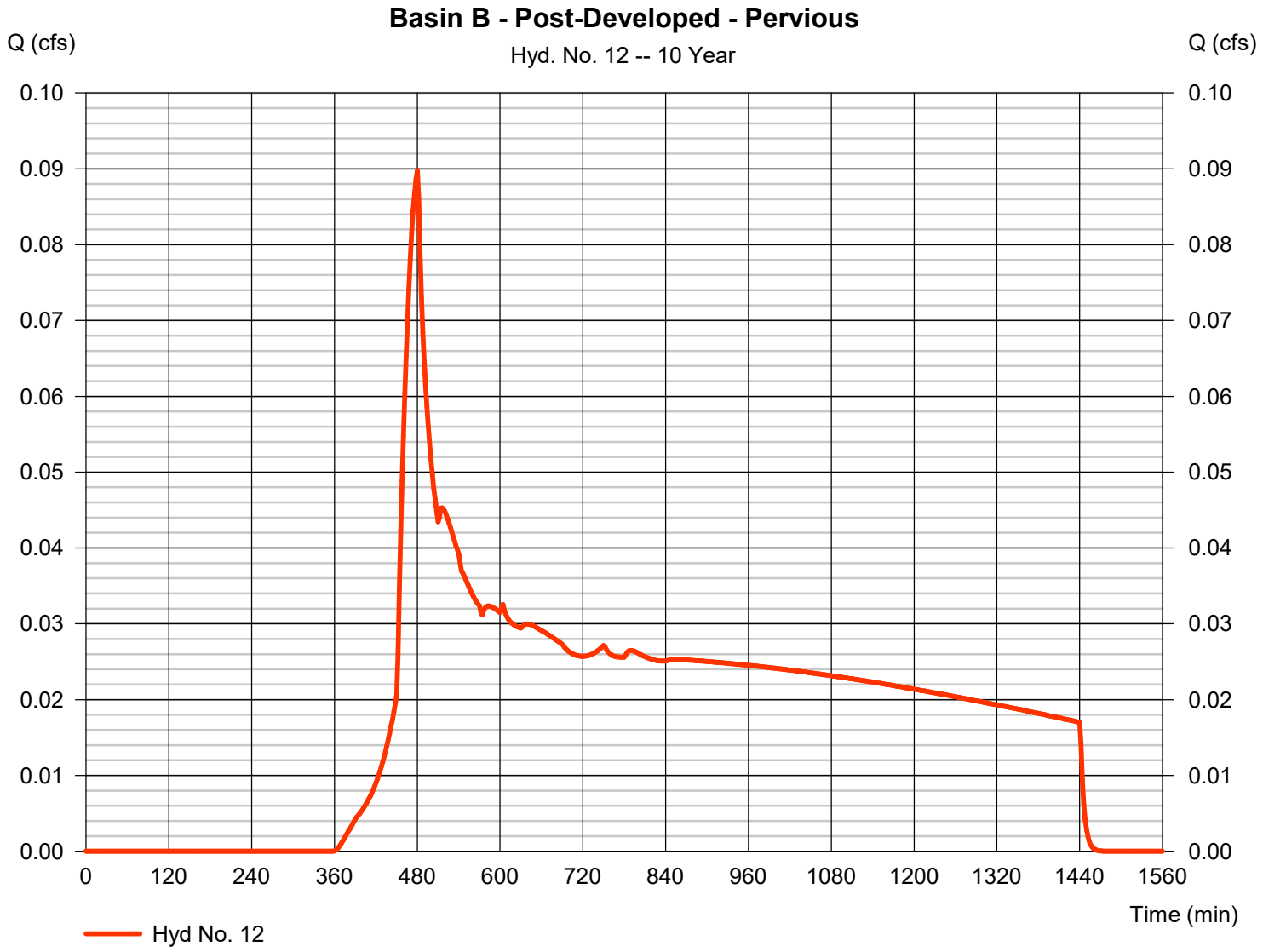


Hydrograph Report

Hyd. No. 12

Basin B - Post-Developed - Pervious

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.090 cfs
Storm frequency	= 10 yrs	Time to peak	= 480 min
Time interval	= 2 min	Hyd. volume	= 1,650 cuft
Drainage area	= 0.377 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.45 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

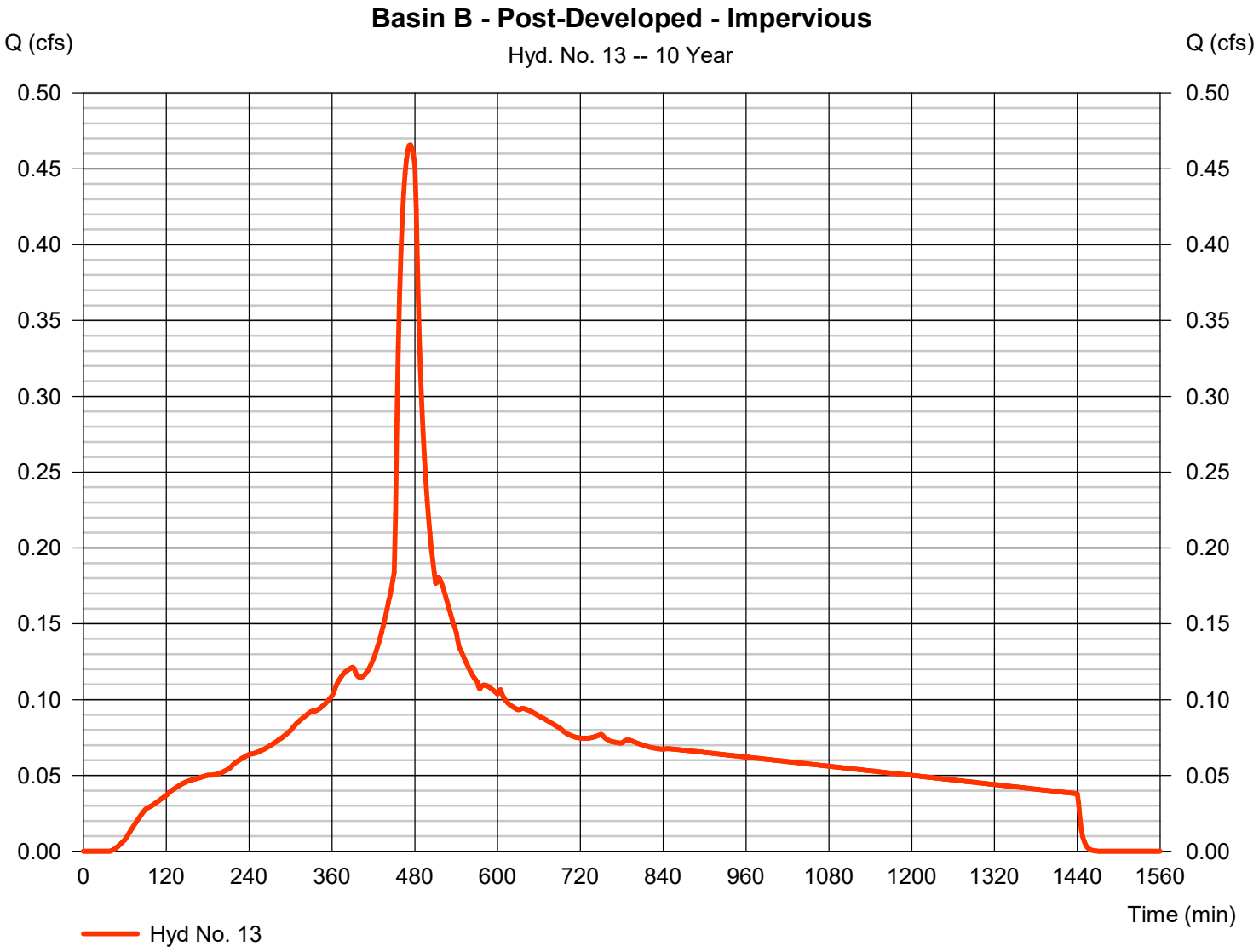


Hydrograph Report

Hyd. No. 13

Basin B - Post-Developed - Impervious

Hydrograph type	=	SBUH Runoff	Peak discharge	=	0.466 cfs
Storm frequency	=	10 yrs	Time to peak	=	474 min
Time interval	=	2 min	Hyd. volume	=	6,737 cuft
Drainage area	=	0.577 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	3.45 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a

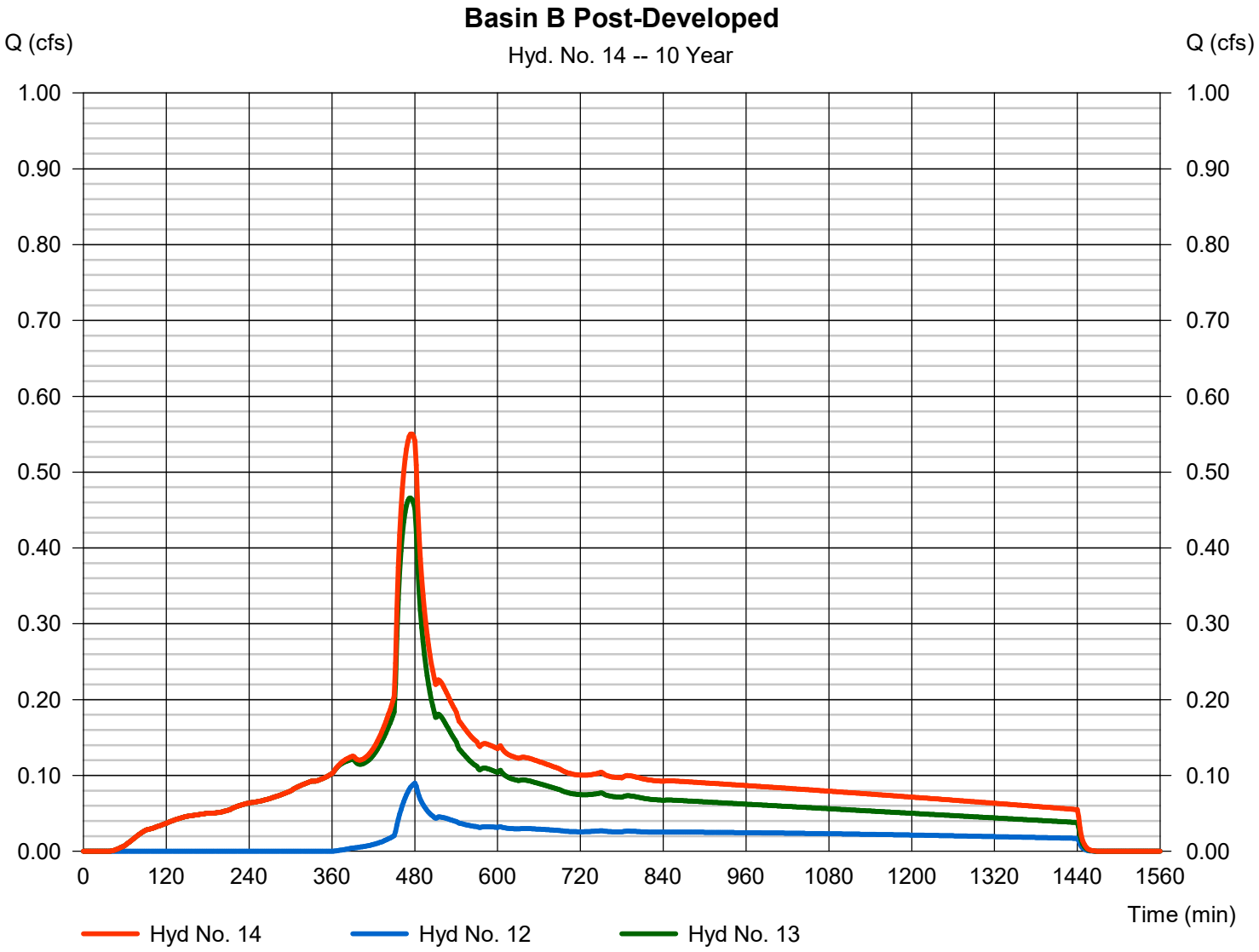


Hydrograph Report

Hyd. No. 14

Basin B Post-Developed

Hydrograph type	=	Combine	Peak discharge	=	0.550 cfs
Storm frequency	=	10 yrs	Time to peak	=	476 min
Time interval	=	2 min	Hyd. volume	=	8,387 cuft
Inflow hyds.	=	12, 13	Contrib. drain. area	=	0.954 ac



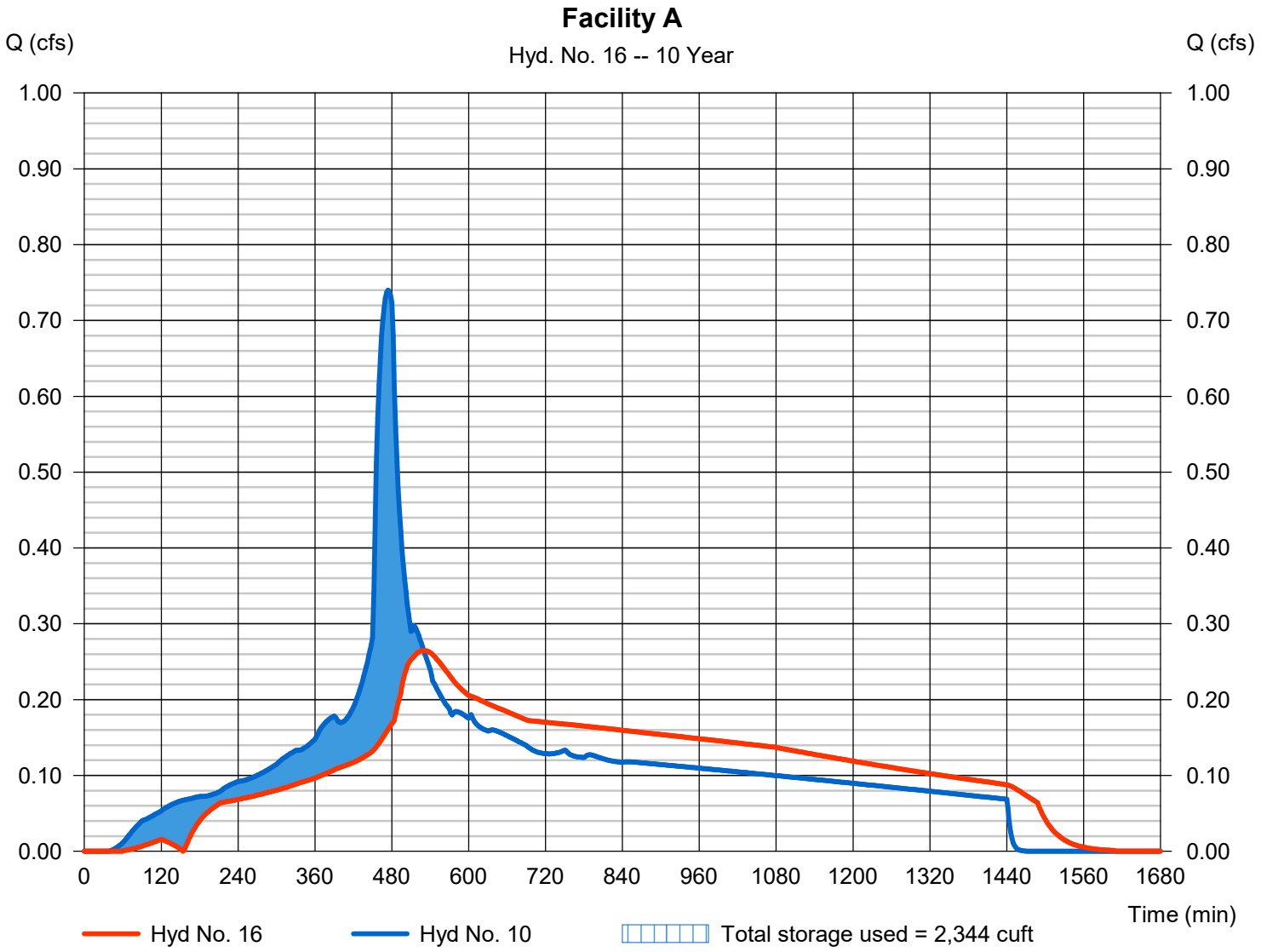
Hydrograph Report

Hyd. No. 16

Facility A

Hydrograph type	=	Reservoir	Peak discharge	=	0.265 cfs
Storm frequency	=	10 yrs	Time to peak	=	530 min
Time interval	=	2 min	Hyd. volume	=	10,831 cuft
Inflow hyd. No.	=	10 - Basin A Post-Developed	Max. Elevation	=	174.68 ft
Reservoir name	=	Extended Dry Basin A	Max. Storage	=	2,344 cuft

Storage Indication method used.



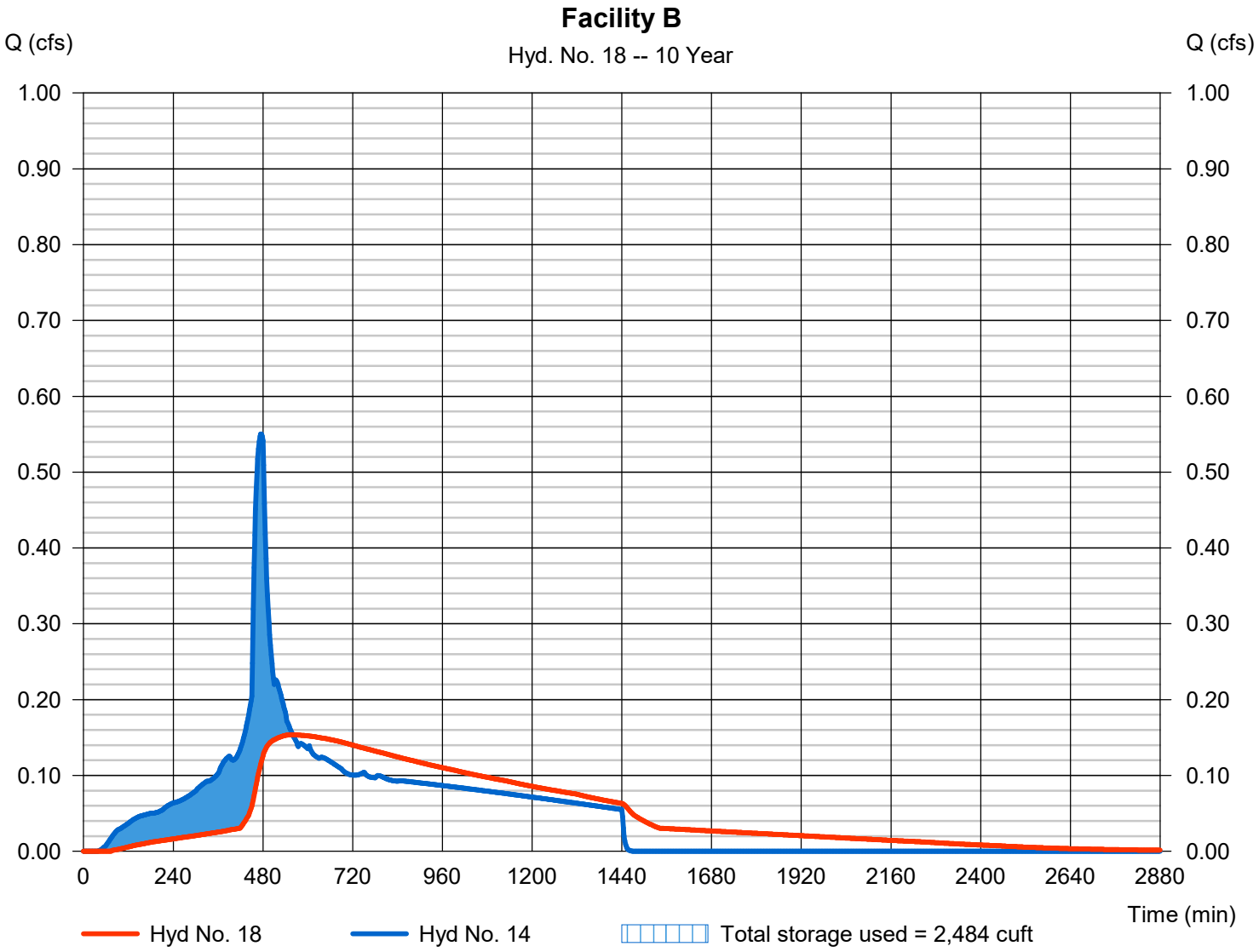
Hydrograph Report

Hyd. No. 18

Facility B

Hydrograph type	=	Reservoir	Peak discharge	=	0.154 cfs
Storm frequency	=	10 yrs	Time to peak	=	560 min
Time interval	=	2 min	Hyd. volume	=	8,372 cuft
Inflow hyd. No.	=	14 - Basin B Post-Developed	Max. Elevation	=	174.36 ft
Reservoir name	=	Extended Dry Basin B	Max. Storage	=	2,484 cuft

Storage Indication method used.



APPENDIX D:

OFFSITE STORMWATER CALCULATIONS & HYDROGRAPHS

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Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

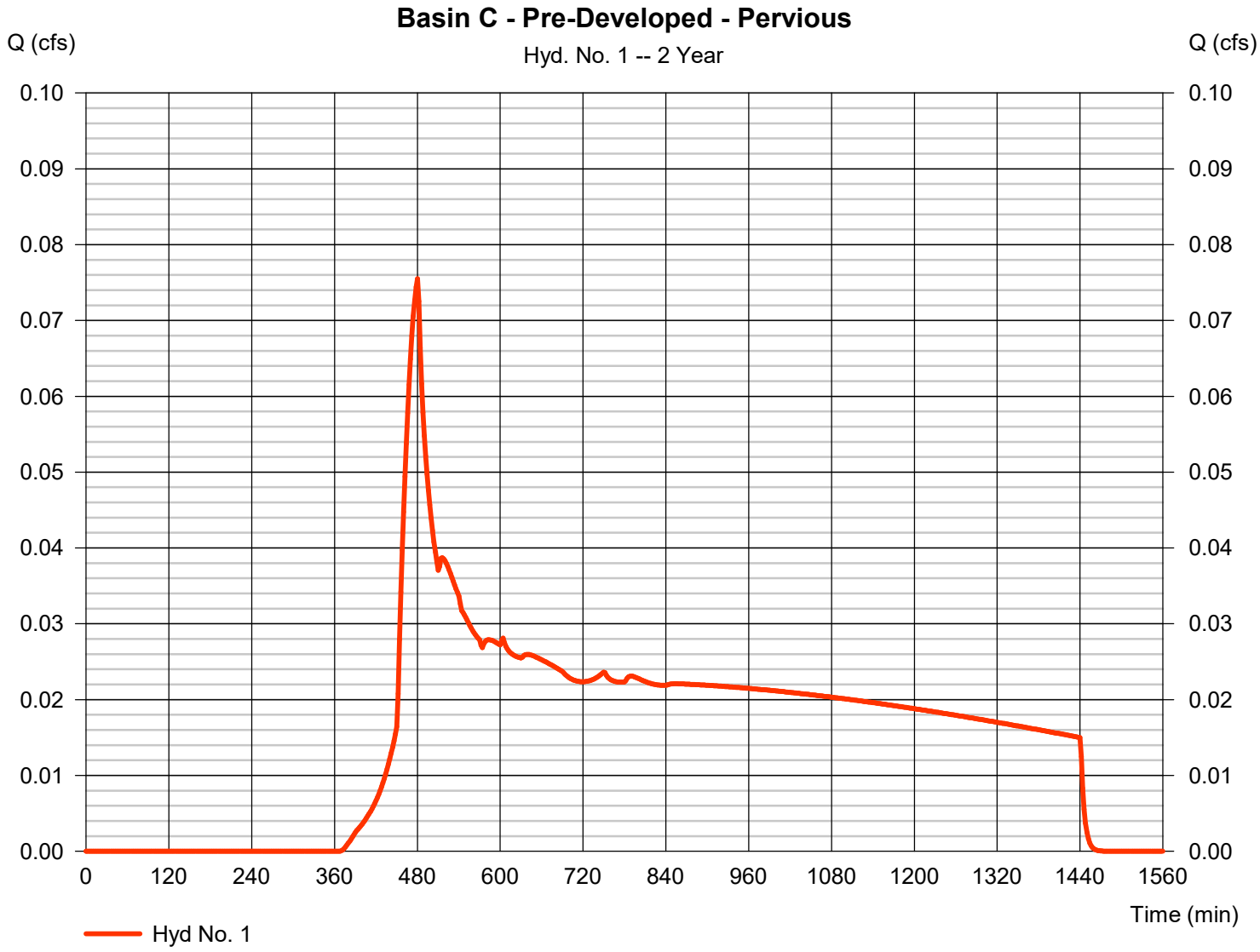
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SBUH Runoff	0.076	2	480	1,426	------	------	------	Basin C - Pre-Developed - Pervious
2	SBUH Runoff	0.047	2	474	668	------	------	------	Basin C - Pre-Developed - Impervious
3	Combine	0.121	2	480	2,093	1, 2	------	------	Basin C Pre-Developed
4	SBUH Runoff	0.022	2	480	416	------	------	------	Basin D - Pre-Developed - Pervious
5	SBUH Runoff	0.035	2	474	503	------	------	------	Basin D - Pre-Developed - Impervious
6	Combine	0.056	2	478	919	4, 5	------	------	Basin D Pre-Developed
8	SBUH Runoff	0.028	2	480	700	------	------	------	Basin C - Post-Developed - Pervious
9	SBUH Runoff	0.134	2	474	1,921	------	------	------	Basin C - Post-Developed - Imperviou
10	Combine	0.159	2	478	2,620	8, 9	------	------	Basin C Post-Developed
12	SBUH Runoff	0.005	2	480	115	------	------	------	Basin D - Post-Developed - Pervious
13	SBUH Runoff	0.085	2	474	1,212	------	------	------	Basin D - Post-Developed - Imperviou
14	Combine	0.089	2	474	1,327	12, 13	------	------	Basin D Post-Developed

Hydrograph Report

Hyd. No. 1

Basin C - Pre-Developed - Pervious

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.076 cfs
Storm frequency	= 2 yrs	Time to peak	= 480 min
Time interval	= 2 min	Hyd. volume	= 1,426 cuft
Drainage area	= 0.469 ac	Curve number	= 79
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 2.50 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

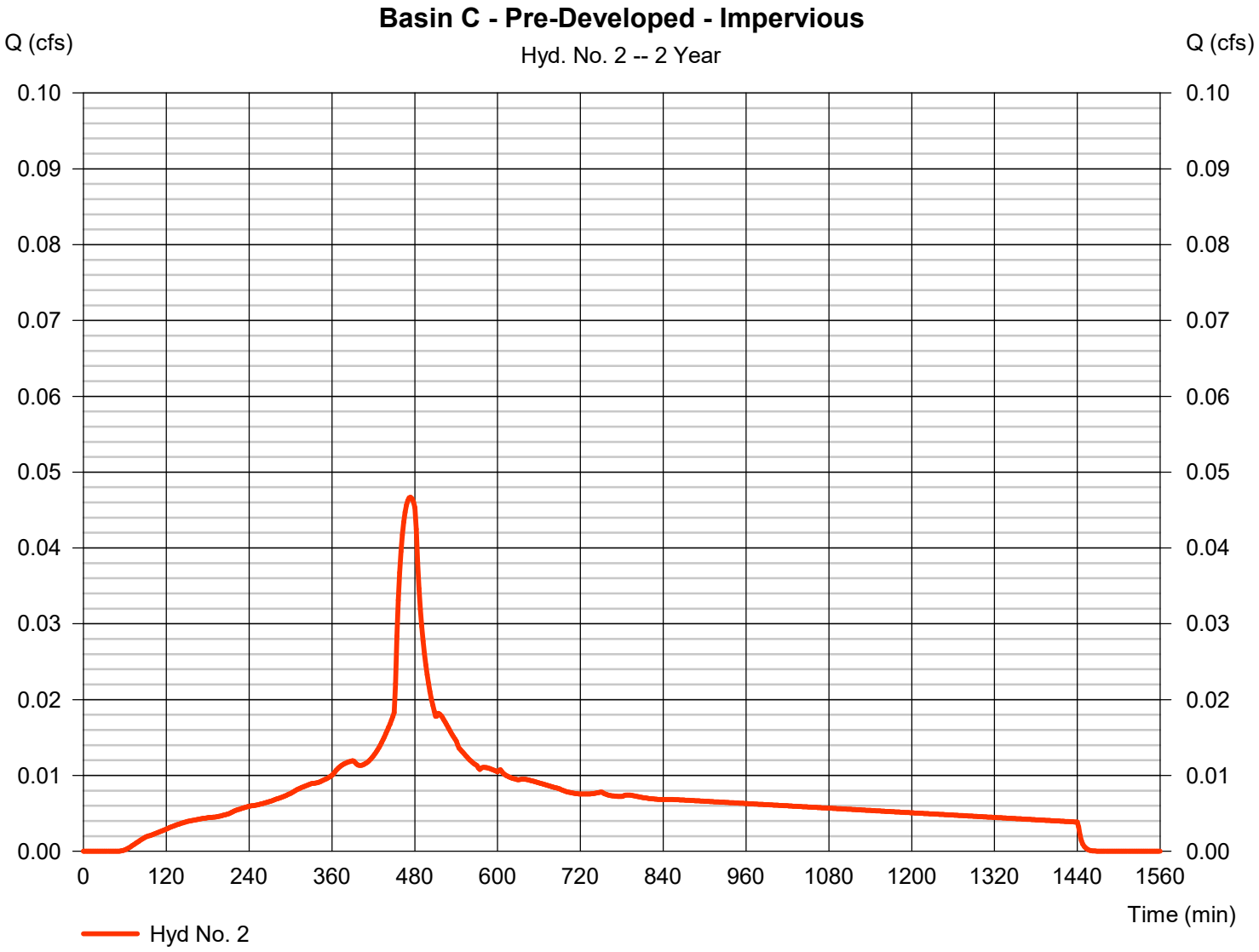


Hydrograph Report

Hyd. No. 2

Basin C - Pre-Developed - Impervious

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.047 cfs
Storm frequency	= 2 yrs	Time to peak	= 474 min
Time interval	= 2 min	Hyd. volume	= 668 cuft
Drainage area	= 0.081 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 2.50 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

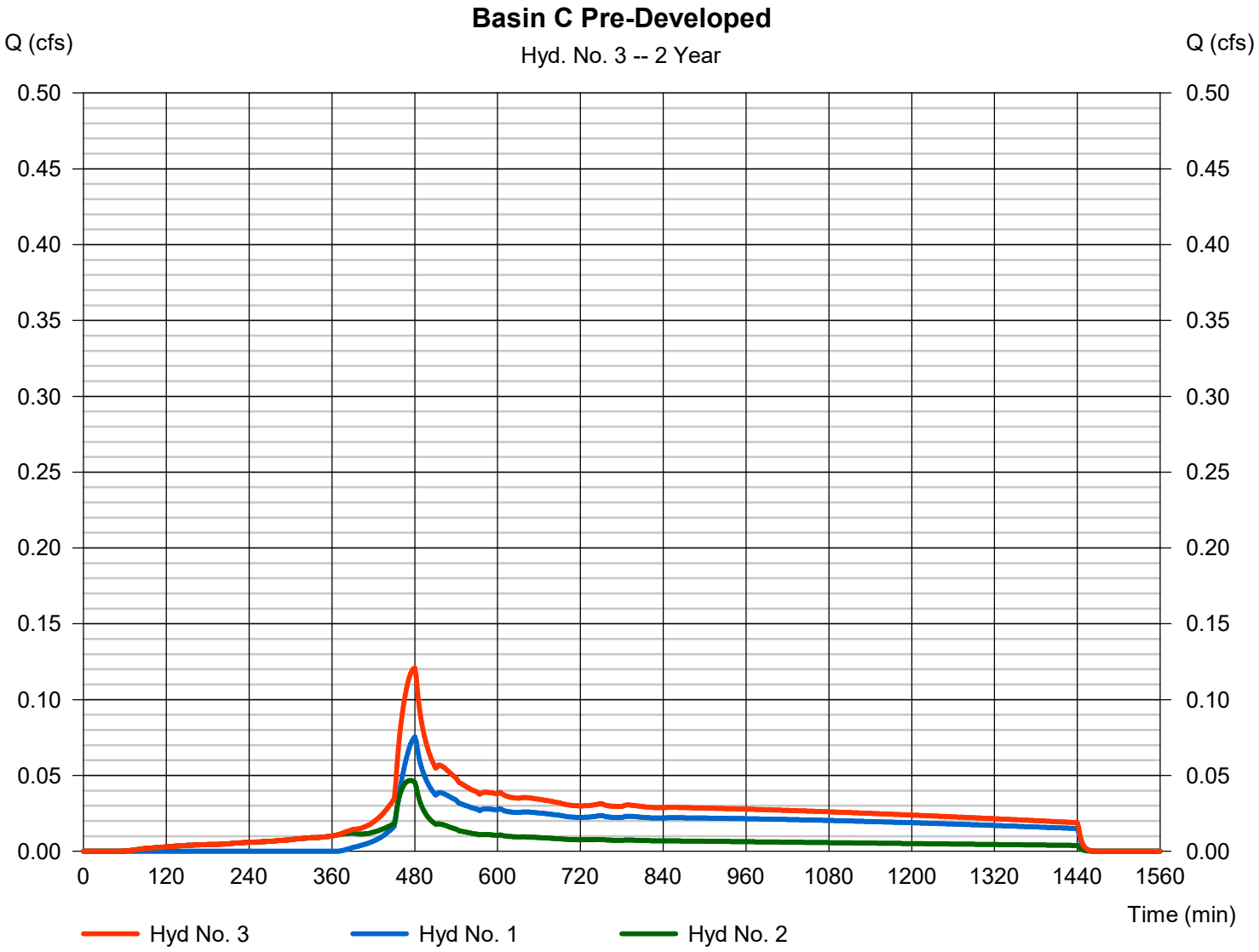


Hydrograph Report

Hyd. No. 3

Basin C Pre-Developed

Hydrograph type	=	Combine	Peak discharge	=	0.121 cfs
Storm frequency	=	2 yrs	Time to peak	=	480 min
Time interval	=	2 min	Hyd. volume	=	2,093 cuft
Inflow hyds.	=	1, 2	Contrib. drain. area	=	0.550 ac

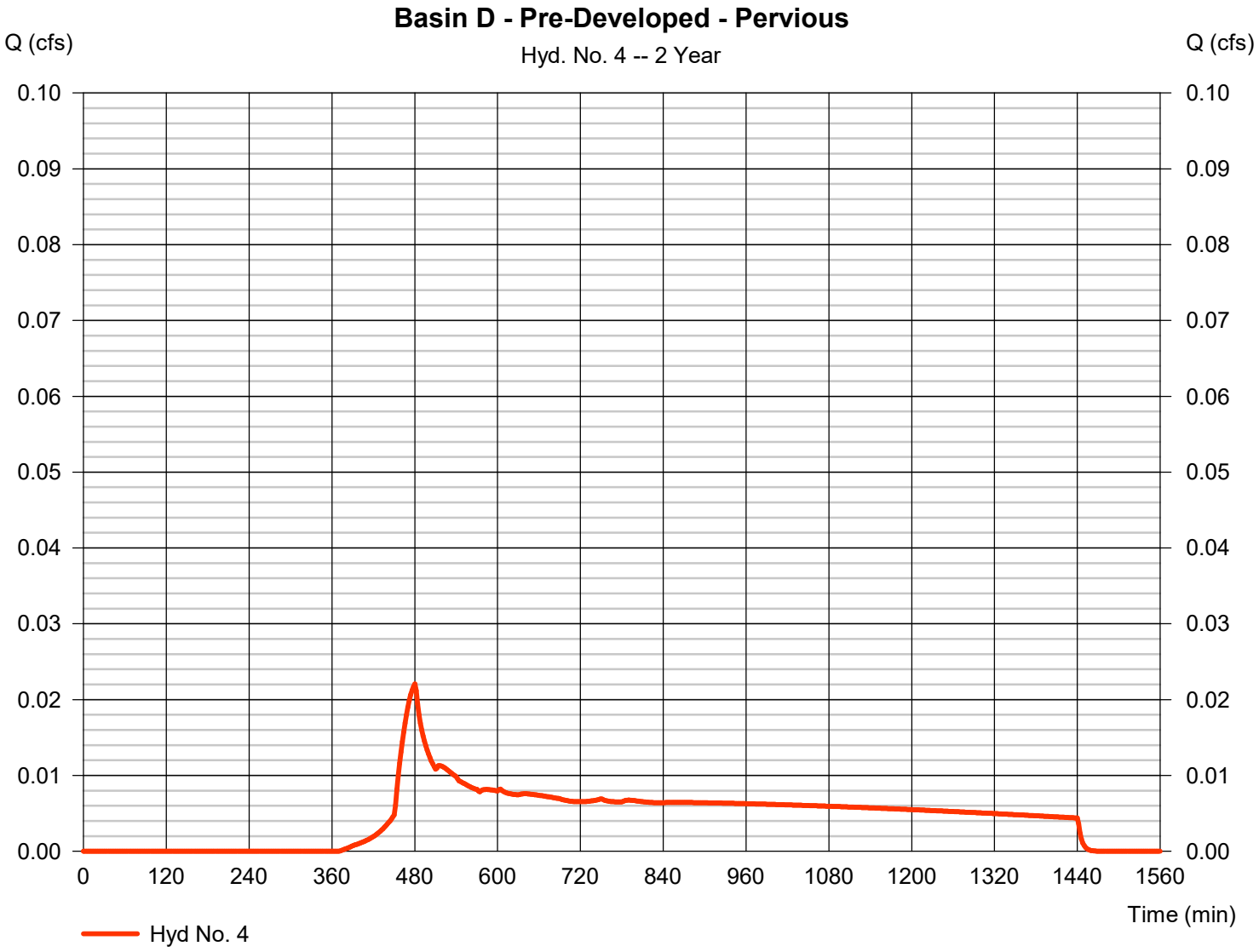


Hydrograph Report

Hyd. No. 4

Basin D - Pre-Developed - Pervious

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.022 cfs
Storm frequency	= 2 yrs	Time to peak	= 480 min
Time interval	= 2 min	Hyd. volume	= 416 cuft
Drainage area	= 0.137 ac	Curve number	= 79
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 2.50 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

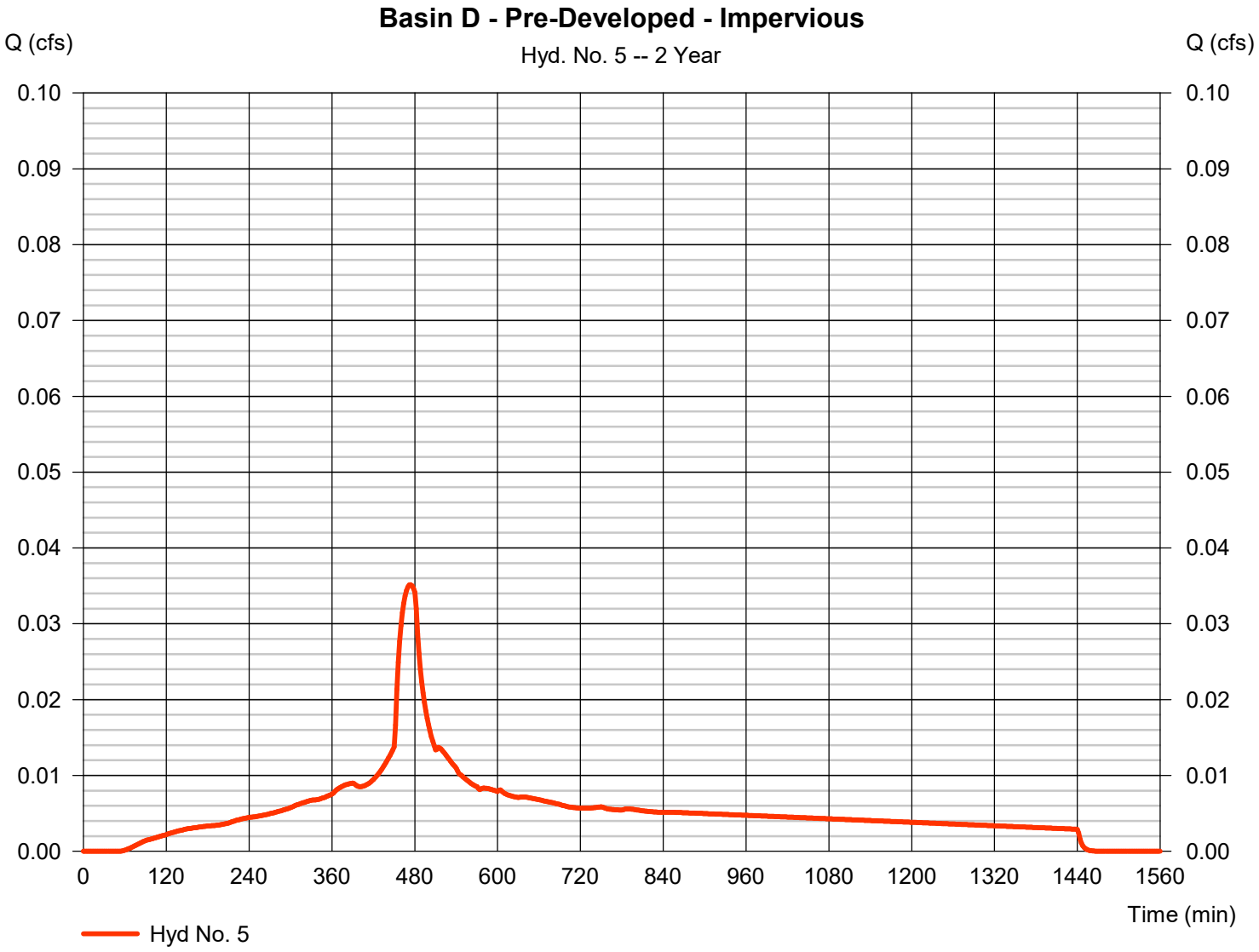


Hydrograph Report

Hyd. No. 5

Basin D - Pre-Developed - Impervious

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.035 cfs
Storm frequency	= 2 yrs	Time to peak	= 474 min
Time interval	= 2 min	Hyd. volume	= 503 cuft
Drainage area	= 0.061 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 2.50 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

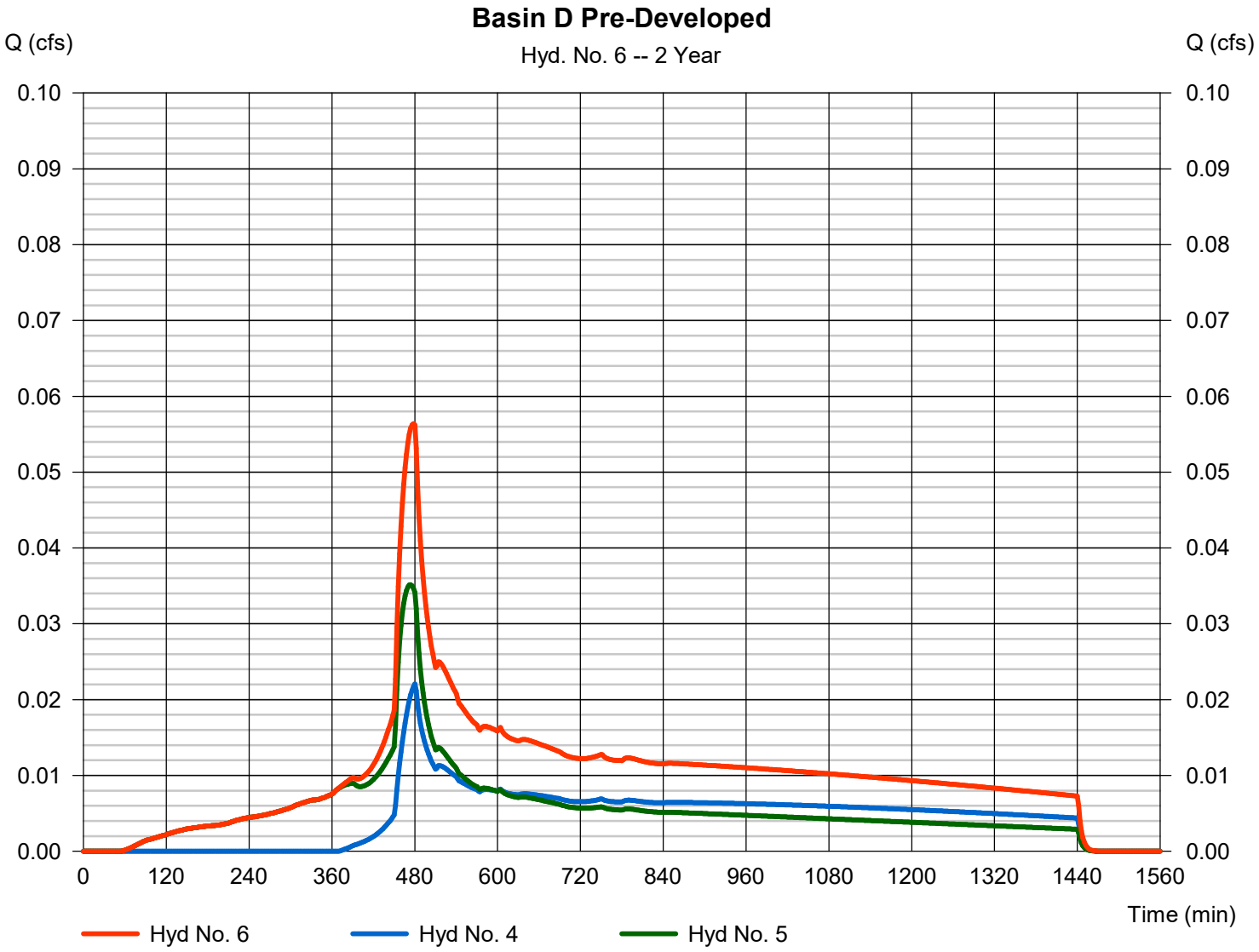


Hydrograph Report

Hyd. No. 6

Basin D Pre-Developed

Hydrograph type	= Combine	Peak discharge	= 0.056 cfs
Storm frequency	= 2 yrs	Time to peak	= 478 min
Time interval	= 2 min	Hyd. volume	= 919 cuft
Inflow hyds.	= 4, 5	Contrib. drain. area	= 0.198 ac

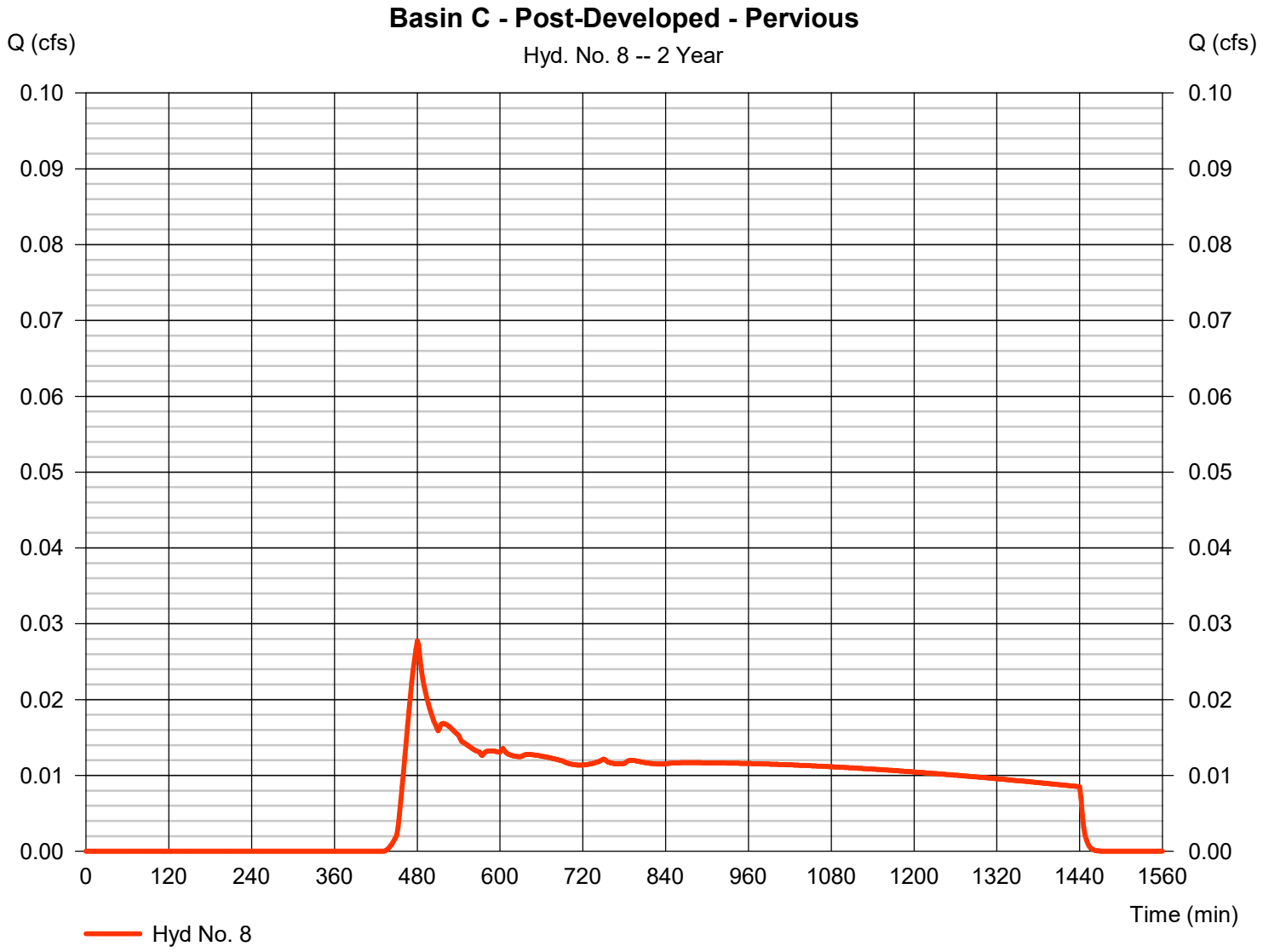


Hydrograph Report

Hyd. No. 8

Basin C - Post-Developed - Pervious

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.028 cfs
Storm frequency	= 2 yrs	Time to peak	= 480 min
Time interval	= 2 min	Hyd. volume	= 700 cuft
Drainage area	= 0.317 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 2.50 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

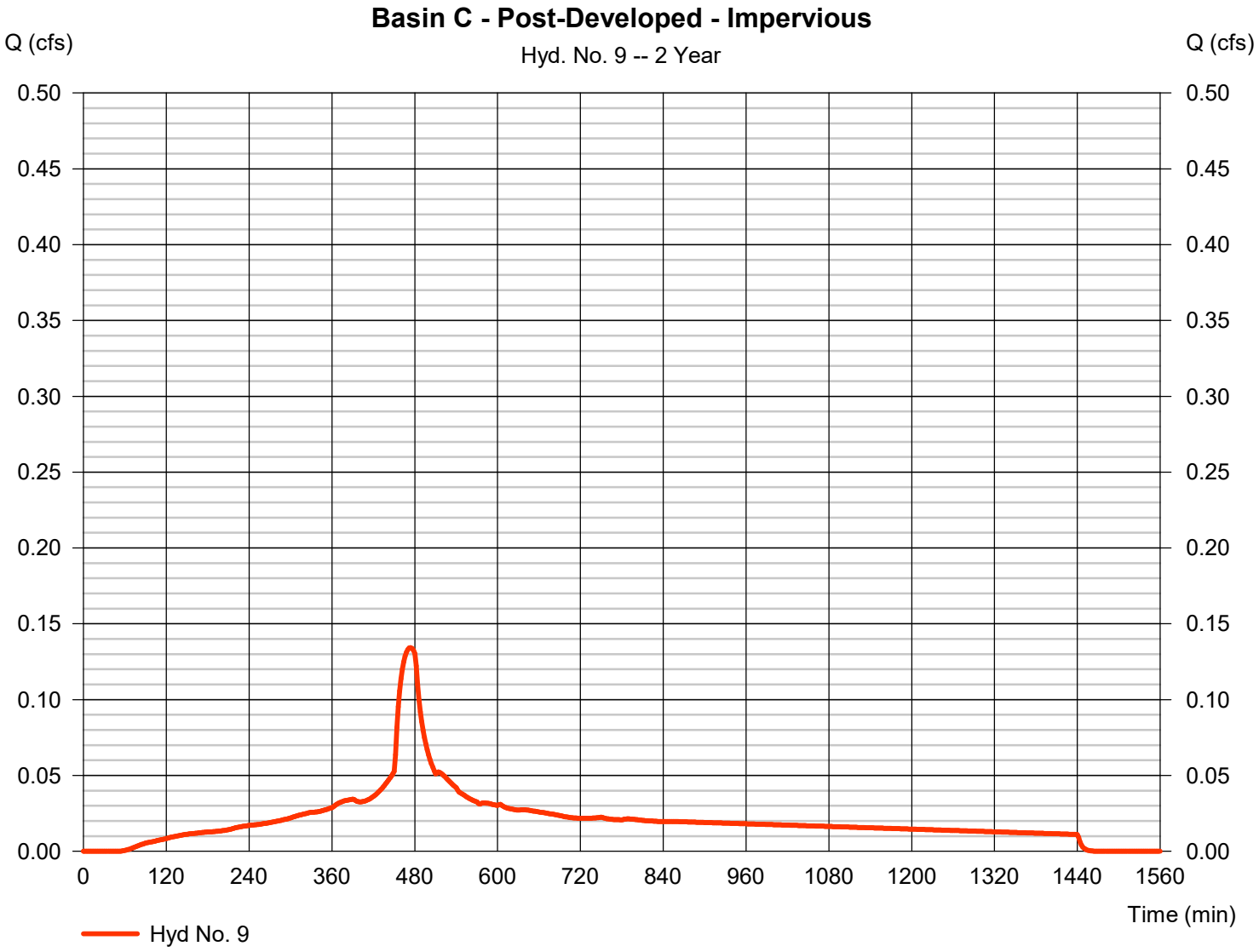


Hydrograph Report

Hyd. No. 9

Basin C - Post-Developed - Impervious

Hydrograph type	=	SBUH Runoff	Peak discharge	=	0.134 cfs
Storm frequency	=	2 yrs	Time to peak	=	474 min
Time interval	=	2 min	Hyd. volume	=	1,921 cuft
Drainage area	=	0.233 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	2.50 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a

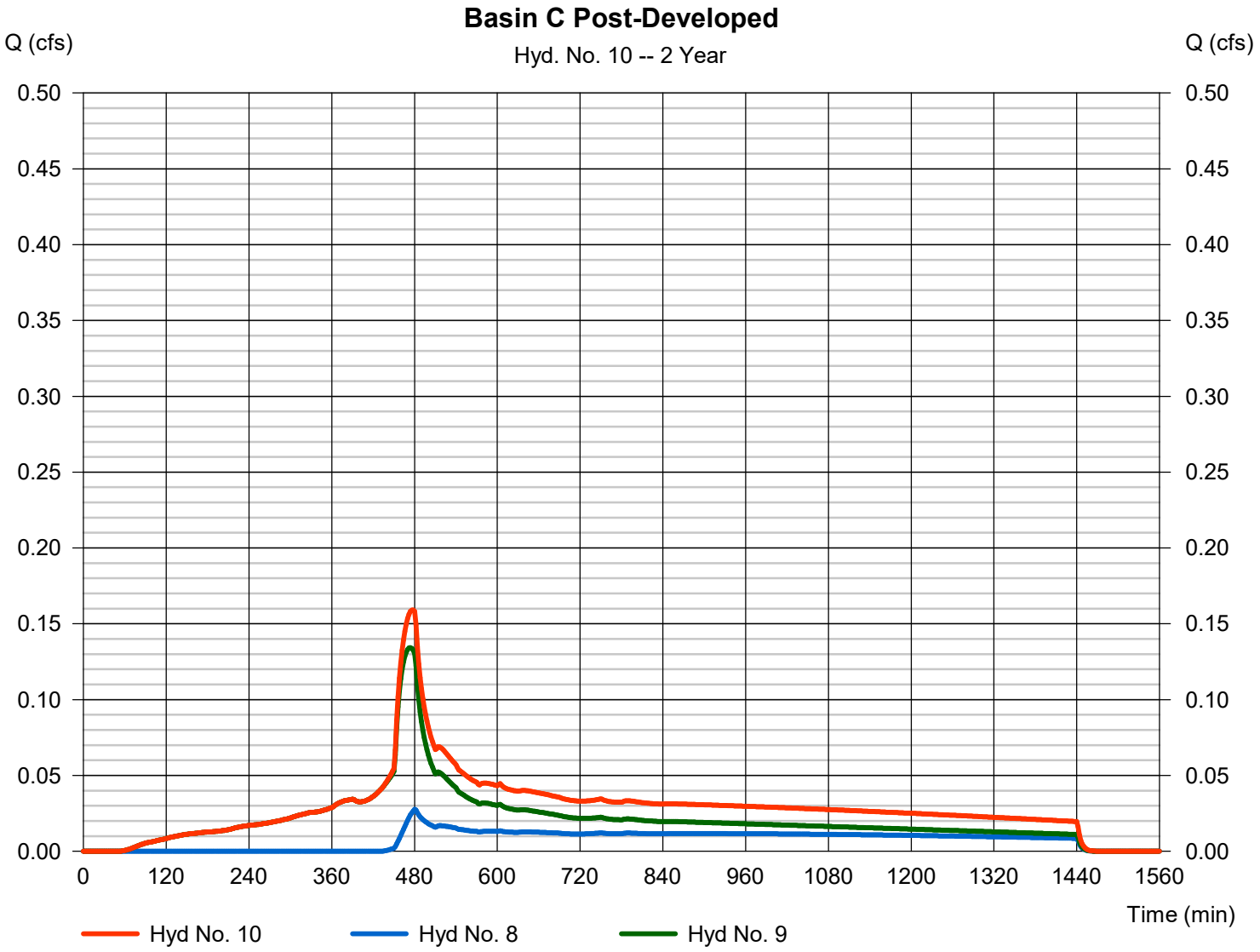


Hydrograph Report

Hyd. No. 10

Basin C Post-Developed

Hydrograph type	=	Combine	Peak discharge	=	0.159 cfs
Storm frequency	=	2 yrs	Time to peak	=	478 min
Time interval	=	2 min	Hyd. volume	=	2,620 cuft
Inflow hyds.	=	8, 9	Contrib. drain. area	=	0.550 ac

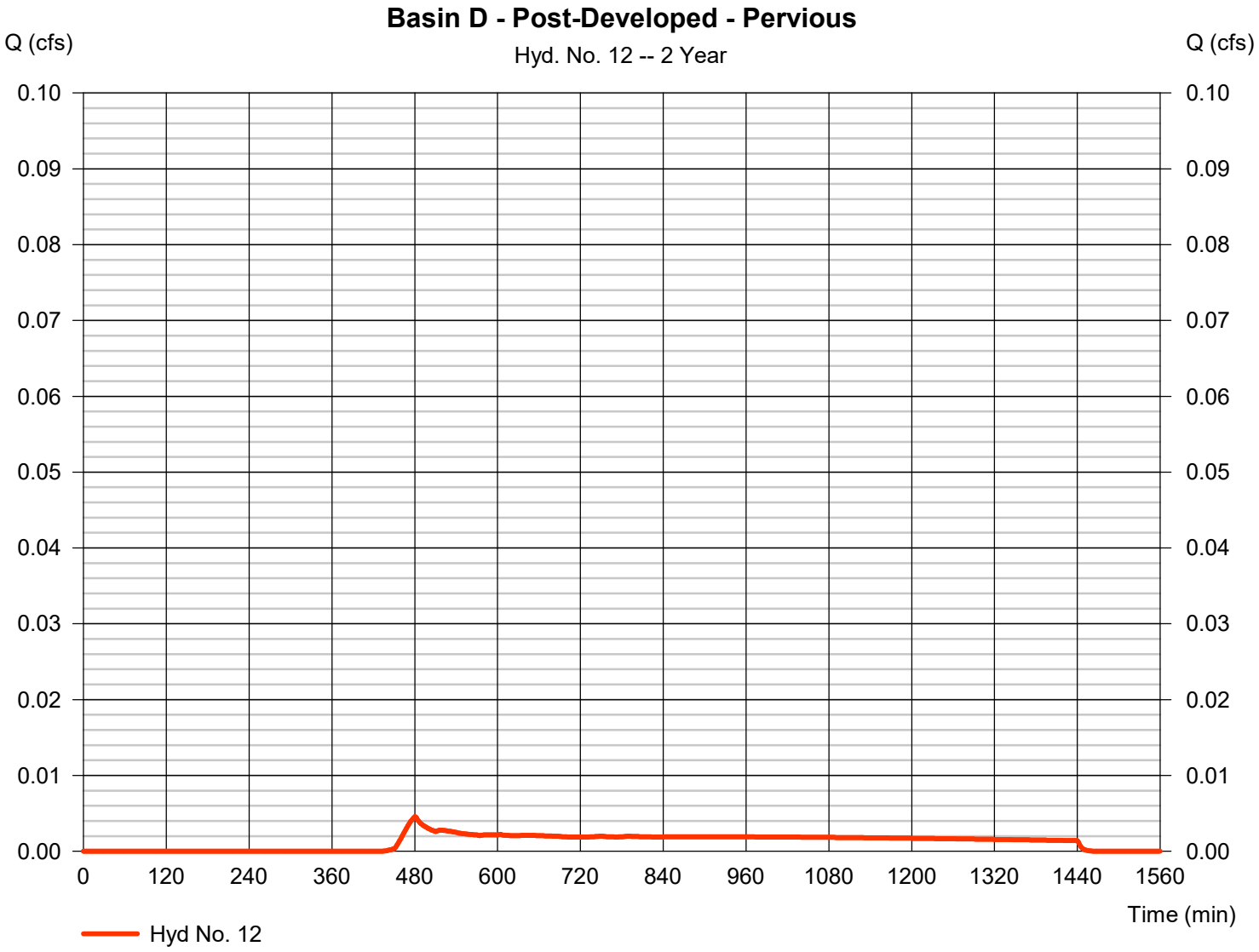


Hydrograph Report

Hyd. No. 12

Basin D - Post-Developed - Pervious

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.005 cfs
Storm frequency	= 2 yrs	Time to peak	= 480 min
Time interval	= 2 min	Hyd. volume	= 115 cuft
Drainage area	= 0.052 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 2.50 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

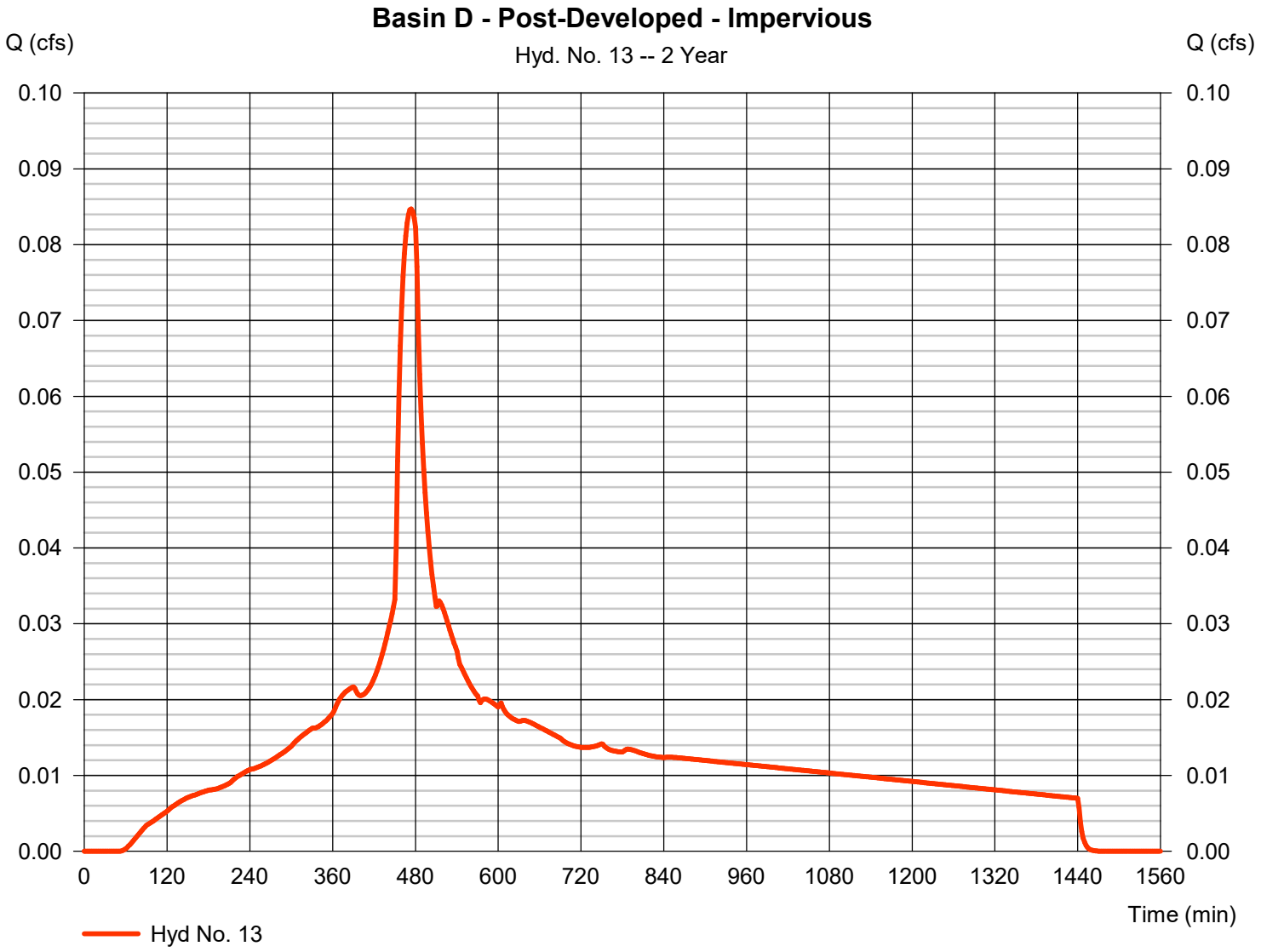


Hydrograph Report

Hyd. No. 13

Basin D - Post-Developed - Impervious

Hydrograph type	=	SBUH Runoff	Peak discharge	=	0.085 cfs
Storm frequency	=	2 yrs	Time to peak	=	474 min
Time interval	=	2 min	Hyd. volume	=	1,212 cuft
Drainage area	=	0.147 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	2.50 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a

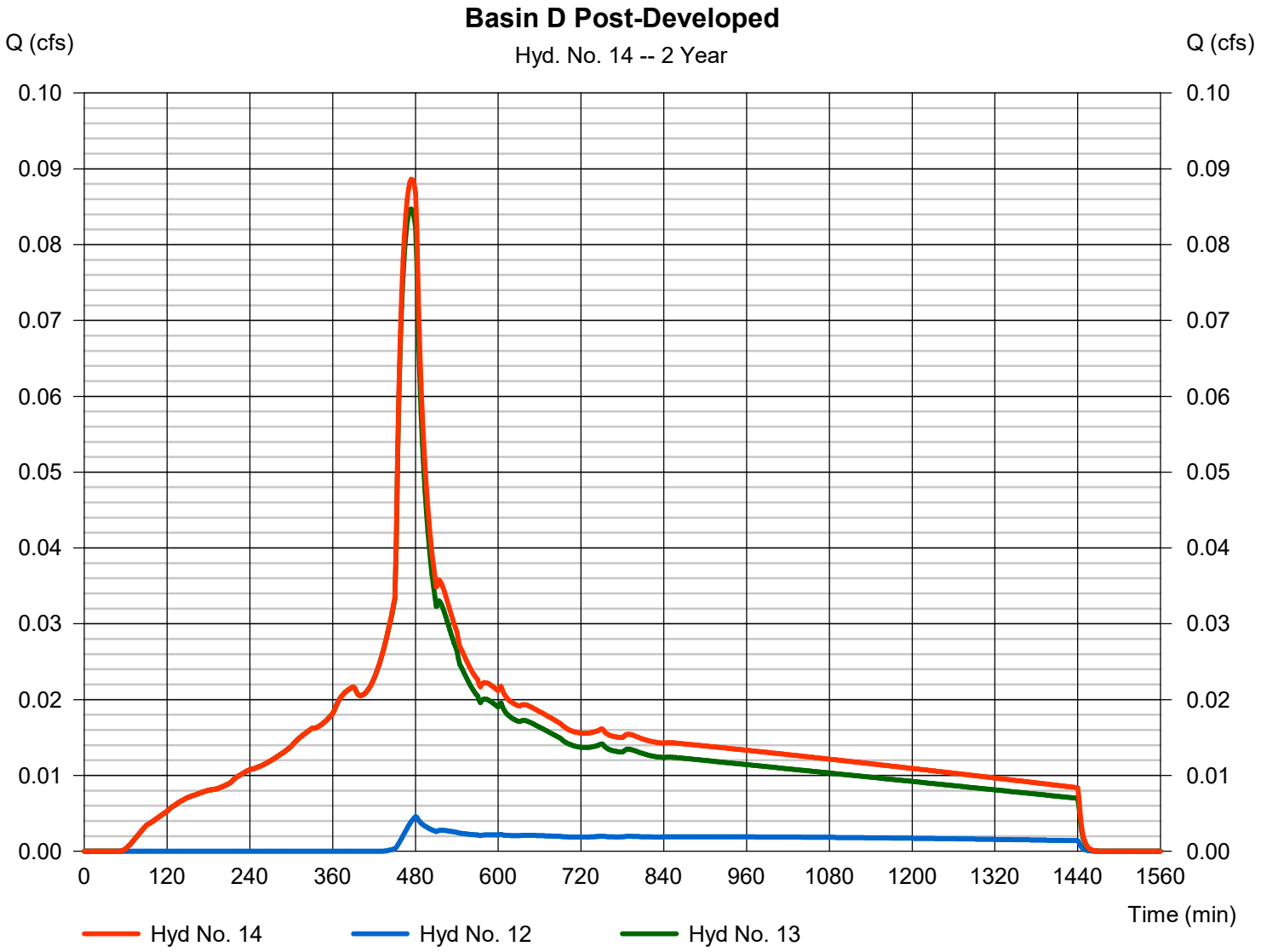


Hydrograph Report

Hyd. No. 14

Basin D Post-Developed

Hydrograph type	=	Combine	Peak discharge	=	0.089 cfs
Storm frequency	=	2 yrs	Time to peak	=	474 min
Time interval	=	2 min	Hyd. volume	=	1,327 cuft
Inflow hyds.	=	12, 13	Contrib. drain. area	=	0.199 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

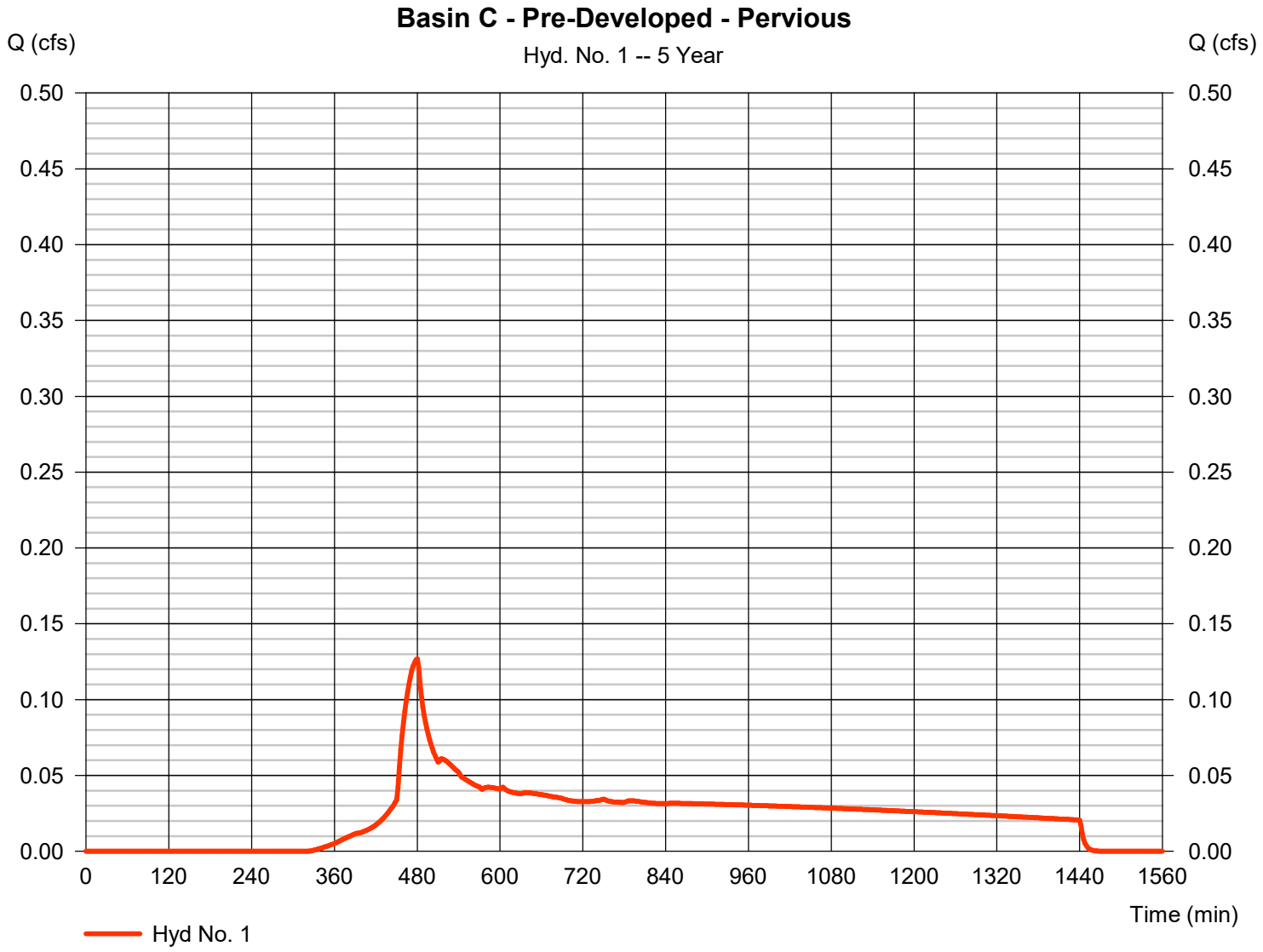
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SBUH Runoff	0.127	2	480	2,149	------	------	------	Basin C - Pre-Developed - Pervious
2	SBUH Runoff	0.059	2	474	843	------	------	------	Basin C - Pre-Developed - Impervious
3	Combine	0.184	2	478	2,992	1, 2	------	------	Basin C Pre-Developed
4	SBUH Runoff	0.037	2	480	628	------	------	------	Basin D - Pre-Developed - Pervious
5	SBUH Runoff	0.044	2	474	635	------	------	------	Basin D - Pre-Developed - Impervious
6	Combine	0.080	2	478	1,263	4, 5	------	------	Basin D Pre-Developed
8	SBUH Runoff	0.057	2	480	1,119	------	------	------	Basin C - Post-Developed - Pervious
9	SBUH Runoff	0.168	2	474	2,426	------	------	------	Basin C - Post-Developed - Imperviou
10	Combine	0.222	2	476	3,544	8, 9	------	------	Basin C Post-Developed
12	SBUH Runoff	0.009	2	480	184	------	------	------	Basin D - Post-Developed - Pervious
13	SBUH Runoff	0.106	2	474	1,530	------	------	------	Basin D - Post-Developed - Imperviou
14	Combine	0.115	2	474	1,714	12, 13	------	------	Basin D Post-Developed

Hydrograph Report

Hyd. No. 1

Basin C - Pre-Developed - Pervious

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.127 cfs
Storm frequency	= 5 yrs	Time to peak	= 480 min
Time interval	= 2 min	Hyd. volume	= 2,149 cuft
Drainage area	= 0.469 ac	Curve number	= 79
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.10 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

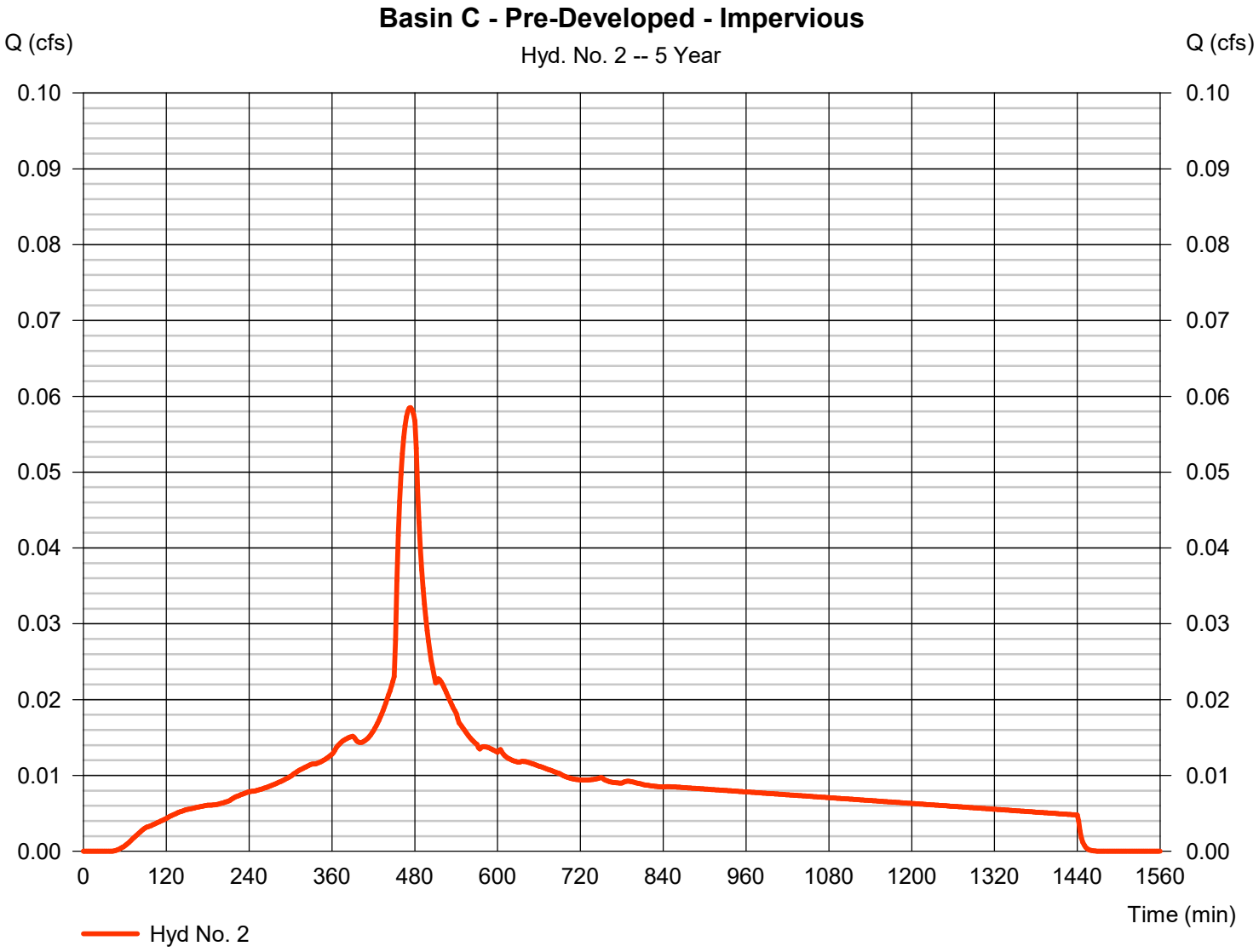


Hydrograph Report

Hyd. No. 2

Basin C - Pre-Developed - Impervious

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.059 cfs
Storm frequency	= 5 yrs	Time to peak	= 474 min
Time interval	= 2 min	Hyd. volume	= 843 cuft
Drainage area	= 0.081 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.10 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

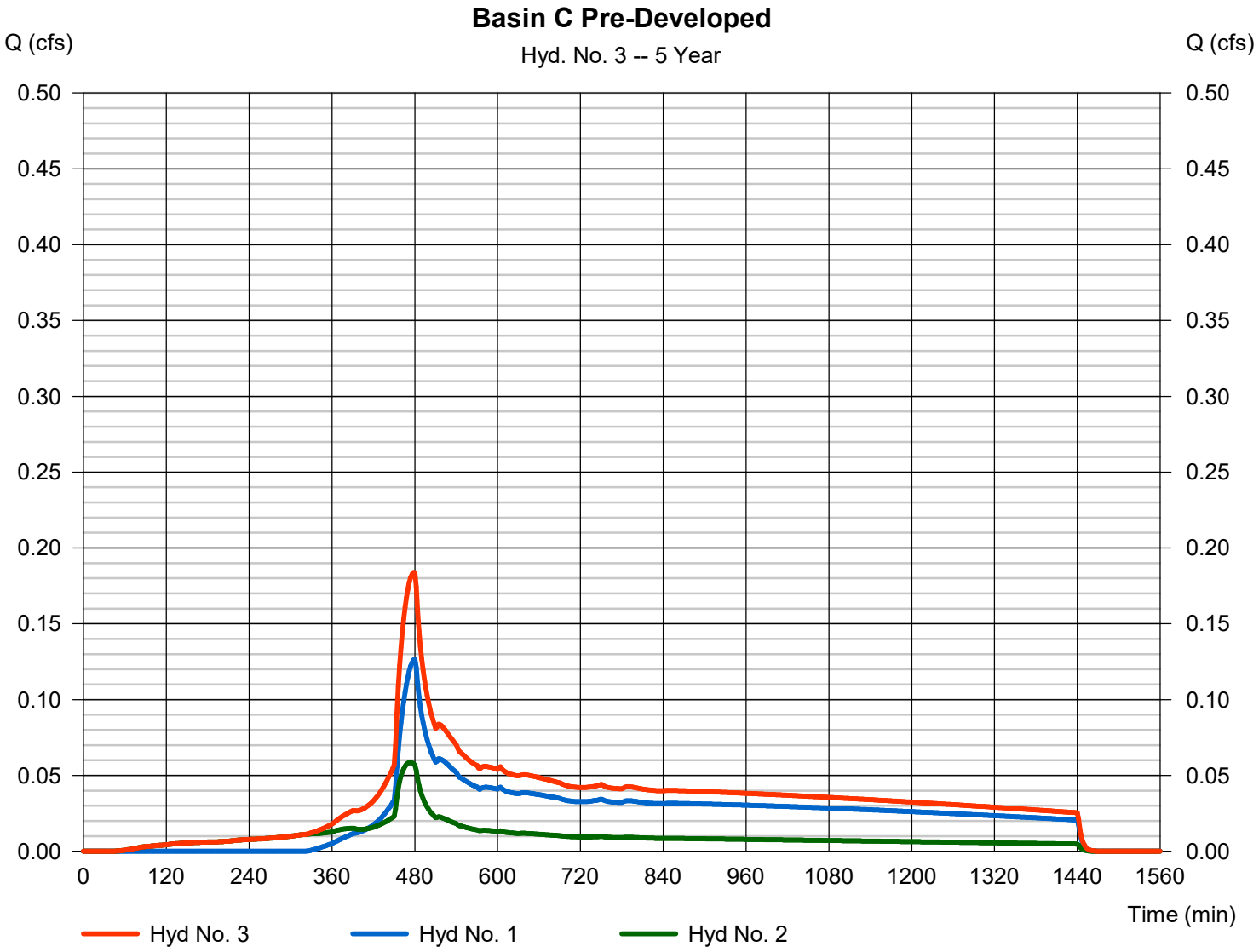


Hydrograph Report

Hyd. No. 3

Basin C Pre-Developed

Hydrograph type	=	Combine	Peak discharge	=	0.184 cfs
Storm frequency	=	5 yrs	Time to peak	=	478 min
Time interval	=	2 min	Hyd. volume	=	2,992 cuft
Inflow hyds.	=	1, 2	Contrib. drain. area	=	0.550 ac

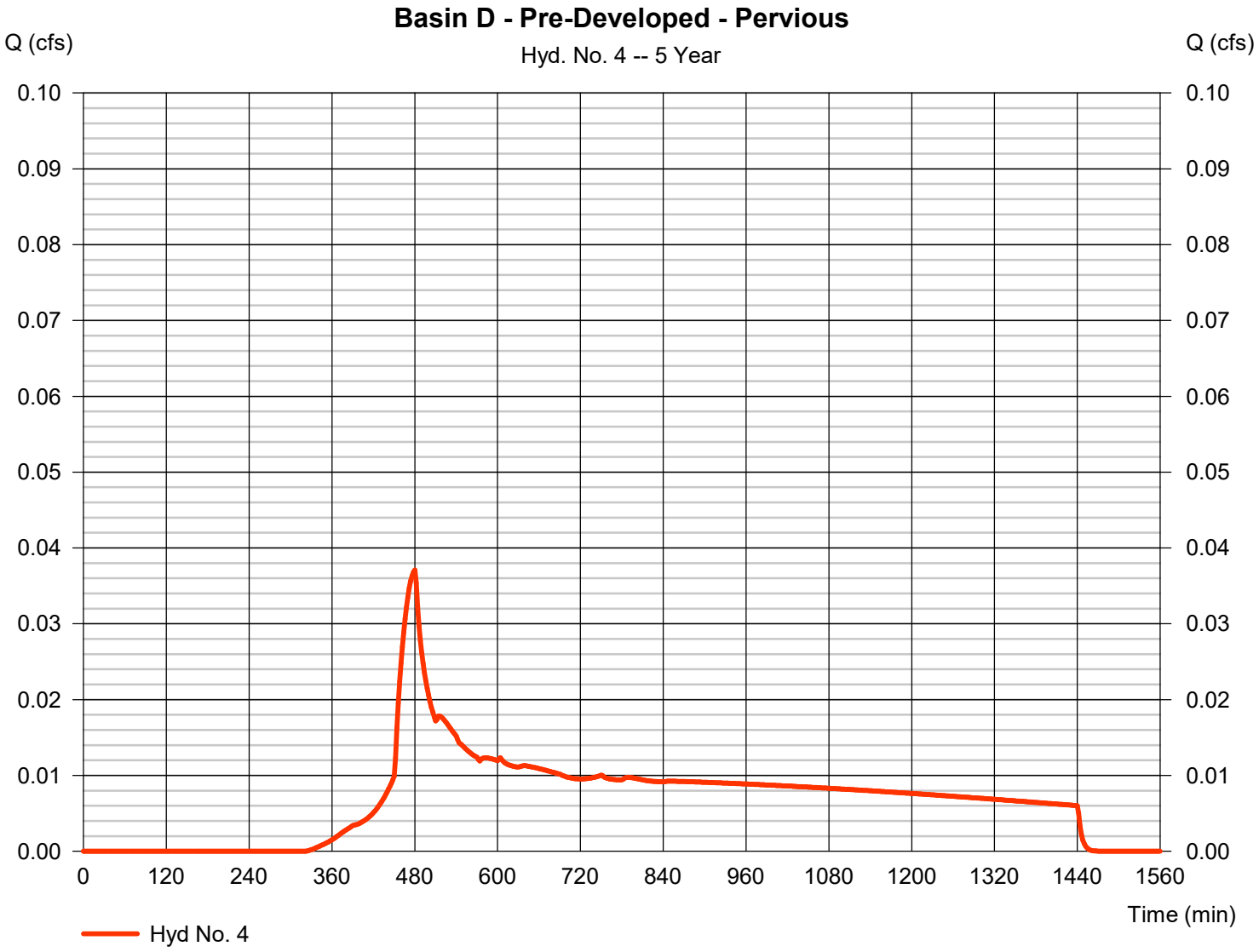


Hydrograph Report

Hyd. No. 4

Basin D - Pre-Developed - Pervious

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.037 cfs
Storm frequency	= 5 yrs	Time to peak	= 480 min
Time interval	= 2 min	Hyd. volume	= 628 cuft
Drainage area	= 0.137 ac	Curve number	= 79
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.10 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

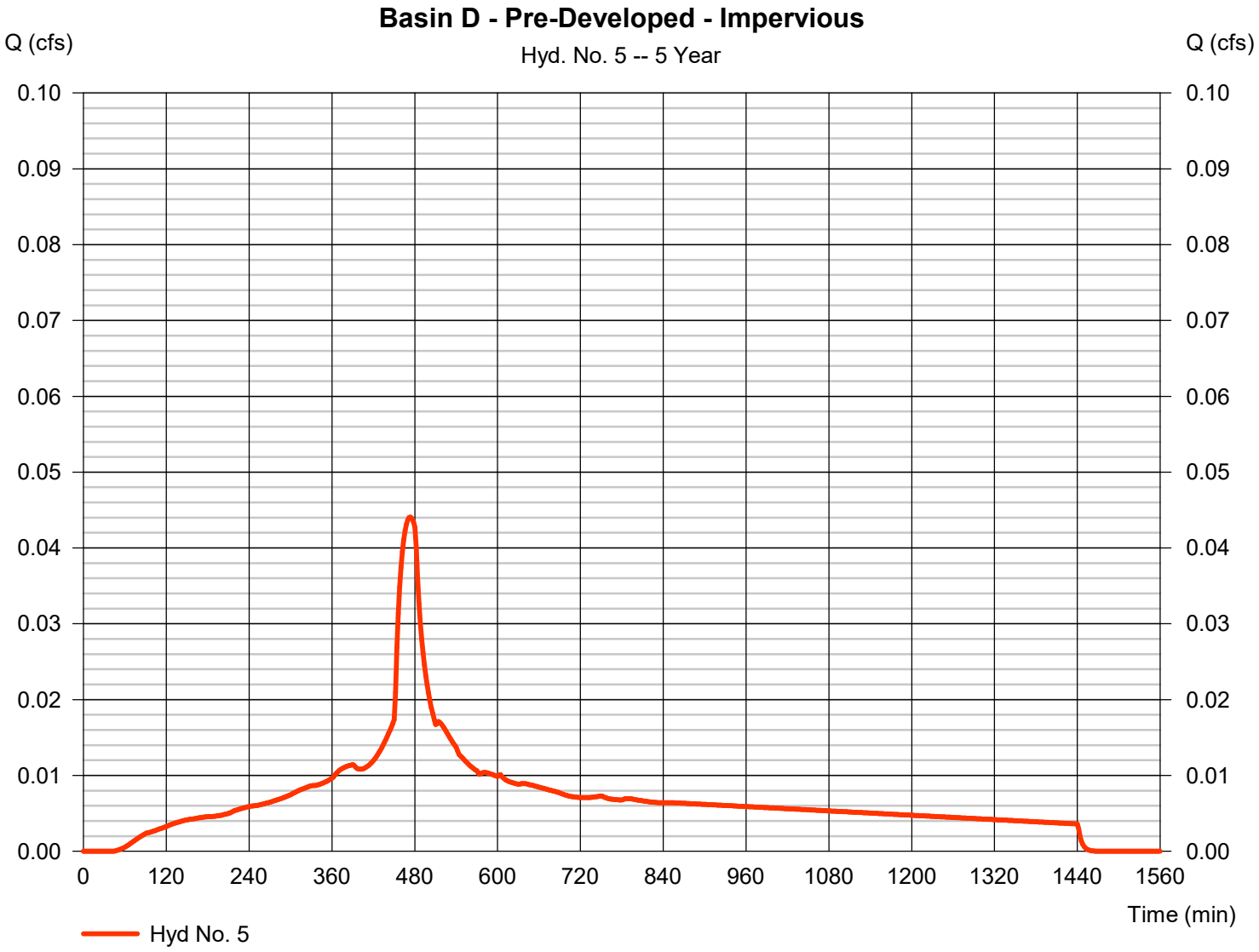


Hydrograph Report

Hyd. No. 5

Basin D - Pre-Developed - Impervious

Hydrograph type	=	SBUH Runoff	Peak discharge	=	0.044 cfs
Storm frequency	=	5 yrs	Time to peak	=	474 min
Time interval	=	2 min	Hyd. volume	=	635 cuft
Drainage area	=	0.061 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	3.10 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a

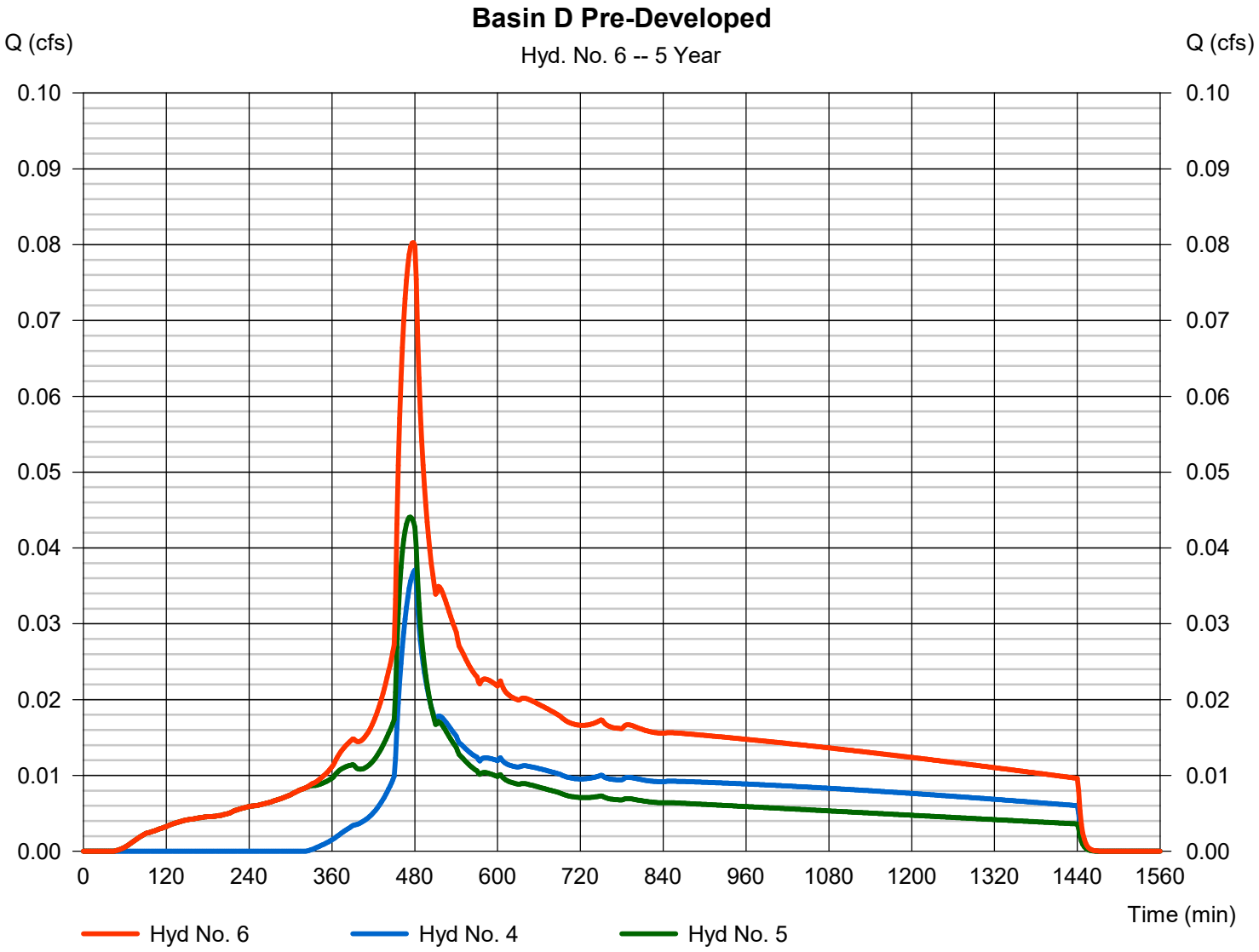


Hydrograph Report

Hyd. No. 6

Basin D Pre-Developed

Hydrograph type	= Combine	Peak discharge	= 0.080 cfs
Storm frequency	= 5 yrs	Time to peak	= 478 min
Time interval	= 2 min	Hyd. volume	= 1,263 cuft
Inflow hyds.	= 4, 5	Contrib. drain. area	= 0.198 ac

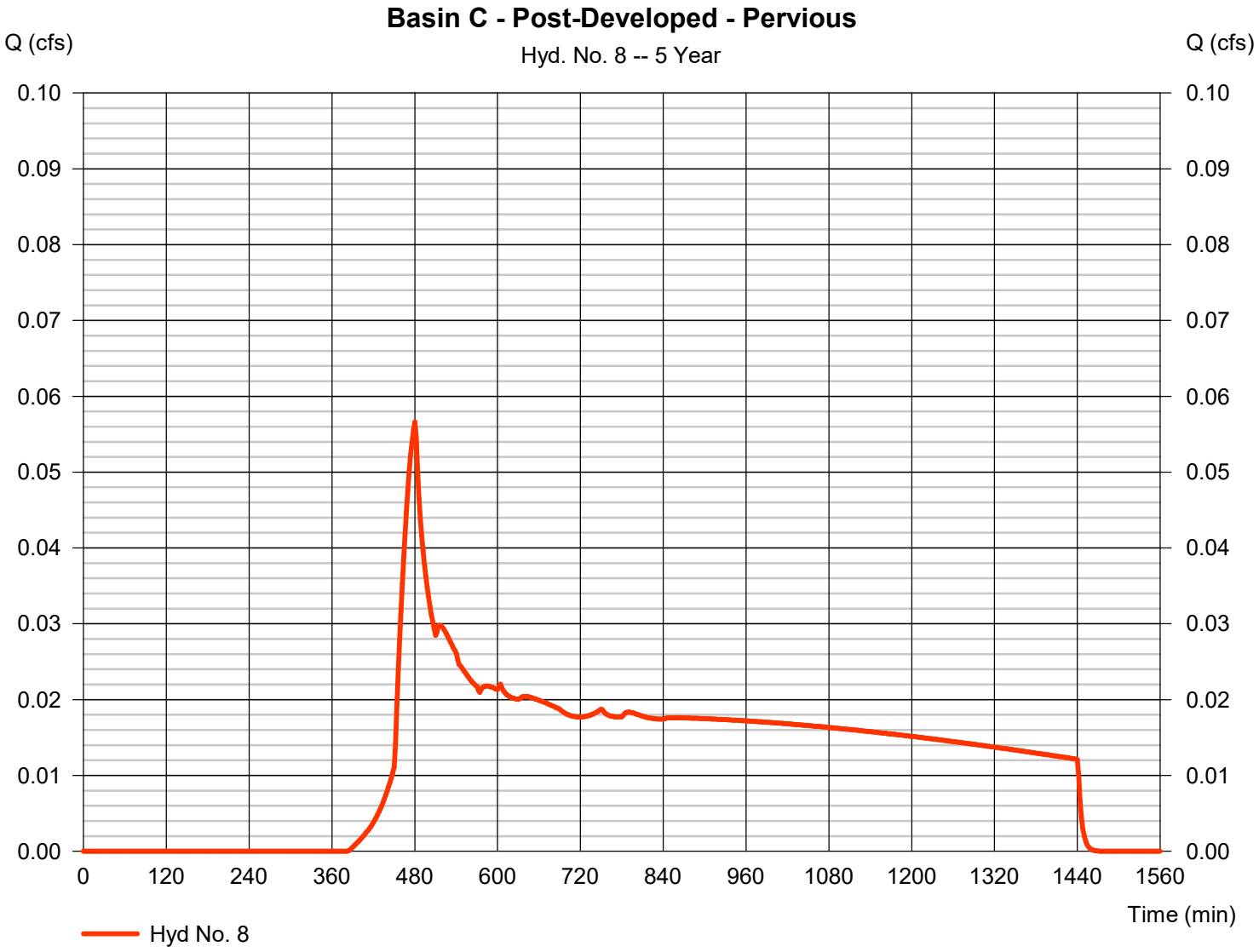


Hydrograph Report

Hyd. No. 8

Basin C - Post-Developed - Pervious

Hydrograph type	=	SBUH Runoff	Peak discharge	=	0.057 cfs
Storm frequency	=	5 yrs	Time to peak	=	480 min
Time interval	=	2 min	Hyd. volume	=	1,119 cuft
Drainage area	=	0.317 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	3.10 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a

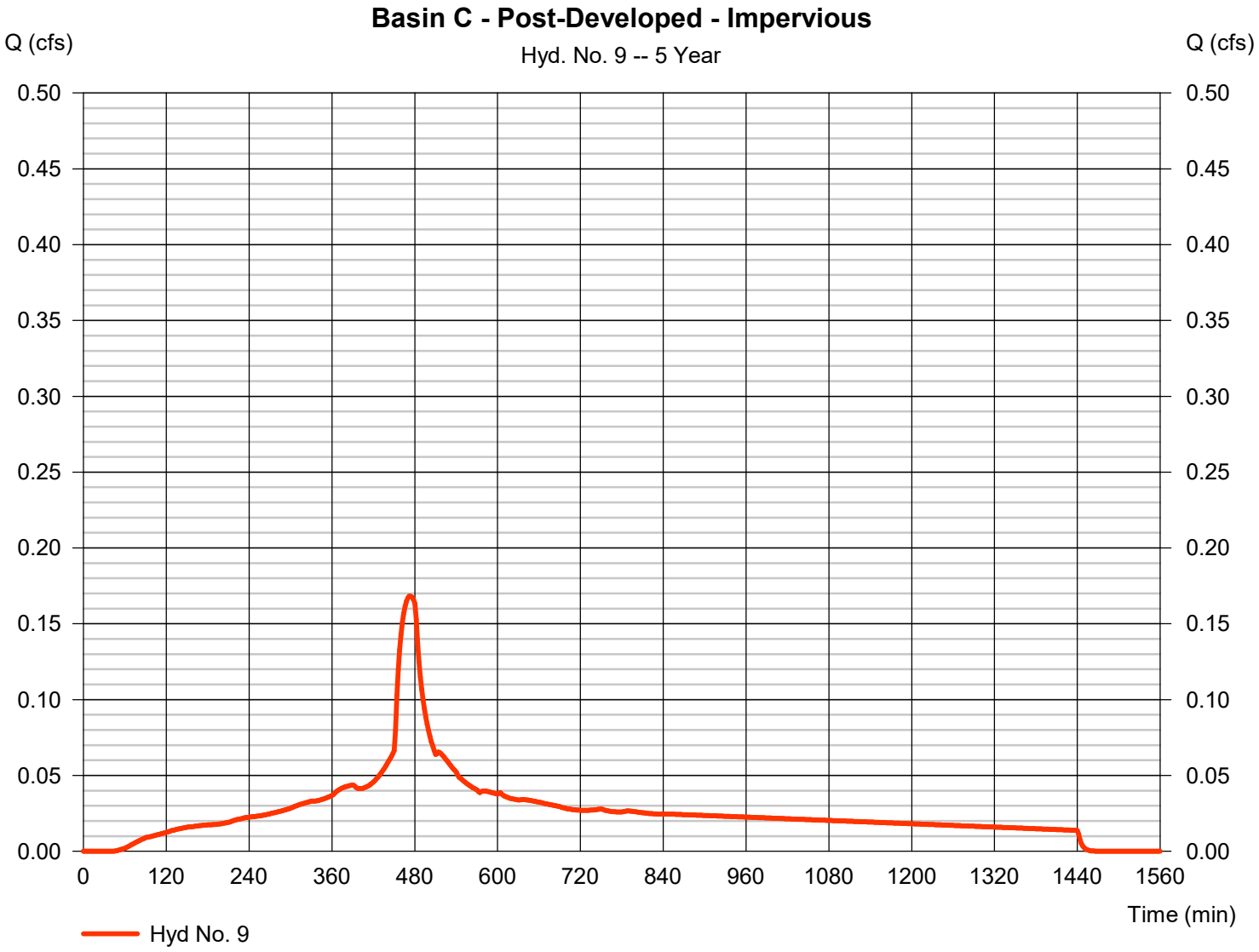


Hydrograph Report

Hyd. No. 9

Basin C - Post-Developed - Impervious

Hydrograph type	=	SBUH Runoff	Peak discharge	=	0.168 cfs
Storm frequency	=	5 yrs	Time to peak	=	474 min
Time interval	=	2 min	Hyd. volume	=	2,426 cuft
Drainage area	=	0.233 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	3.10 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a

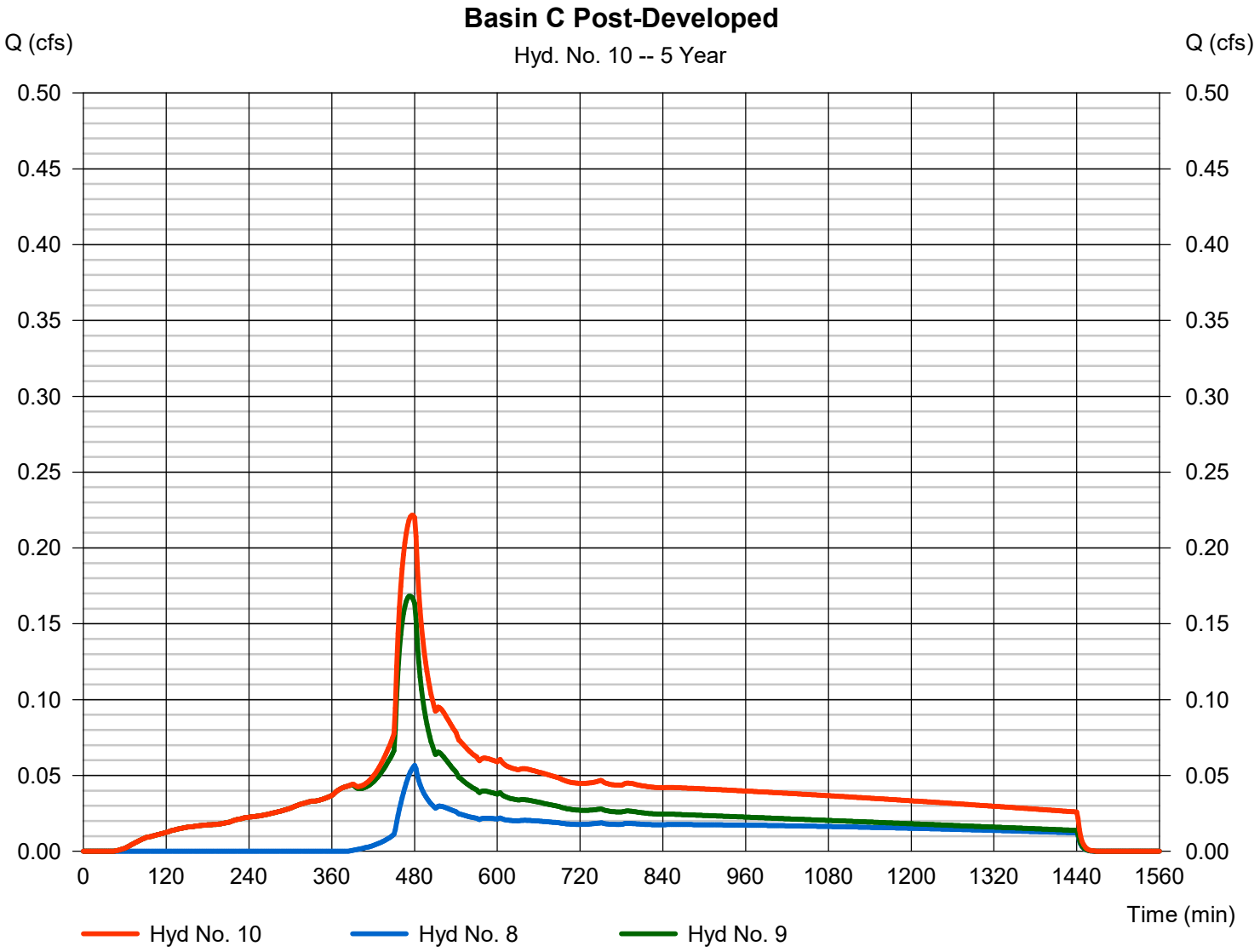


Hydrograph Report

Hyd. No. 10

Basin C Post-Developed

Hydrograph type	=	Combine	Peak discharge	=	0.222 cfs
Storm frequency	=	5 yrs	Time to peak	=	476 min
Time interval	=	2 min	Hyd. volume	=	3,544 cuft
Inflow hyds.	=	8, 9	Contrib. drain. area	=	0.550 ac

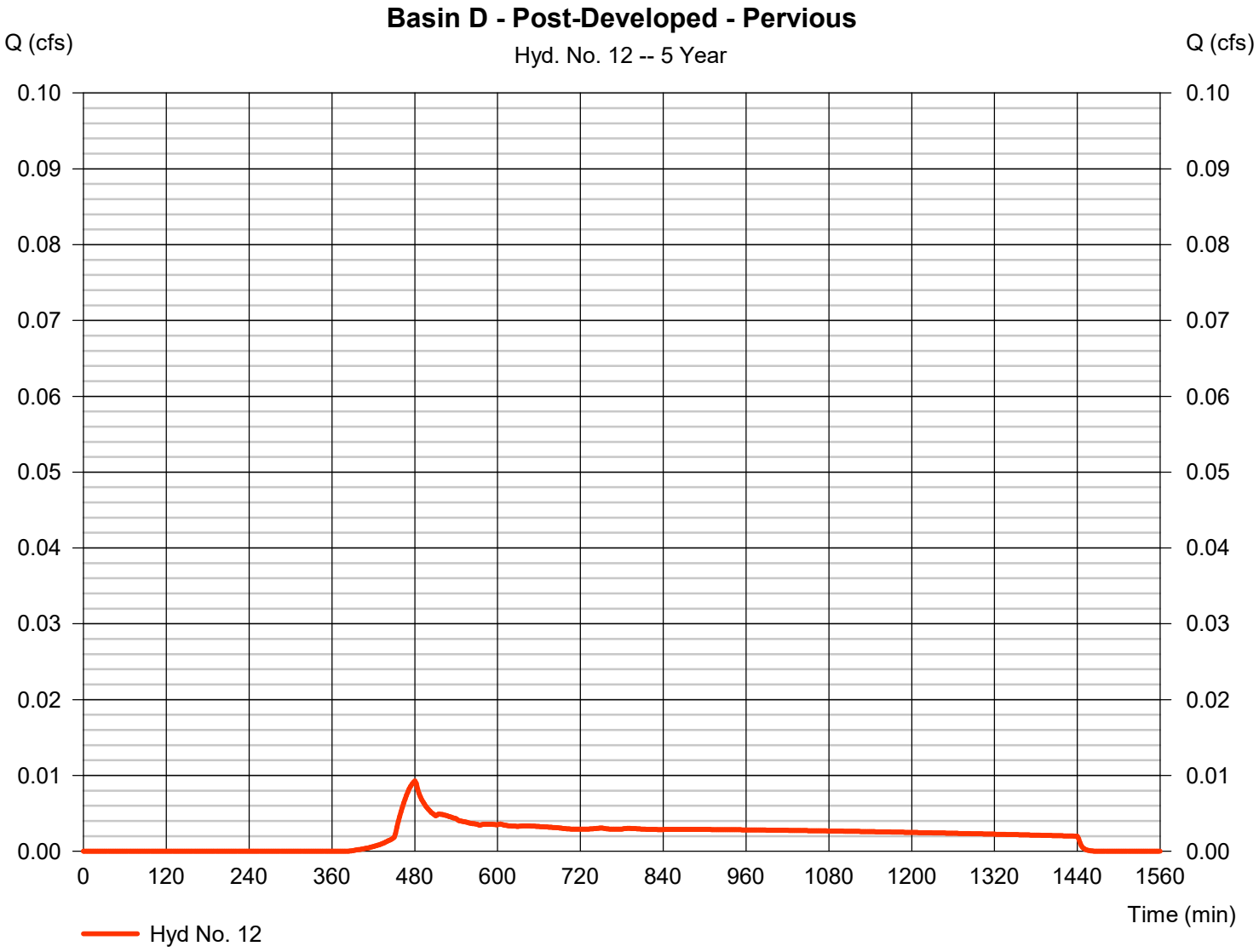


Hydrograph Report

Hyd. No. 12

Basin D - Post-Developed - Pervious

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.009 cfs
Storm frequency	= 5 yrs	Time to peak	= 480 min
Time interval	= 2 min	Hyd. volume	= 184 cuft
Drainage area	= 0.052 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.10 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

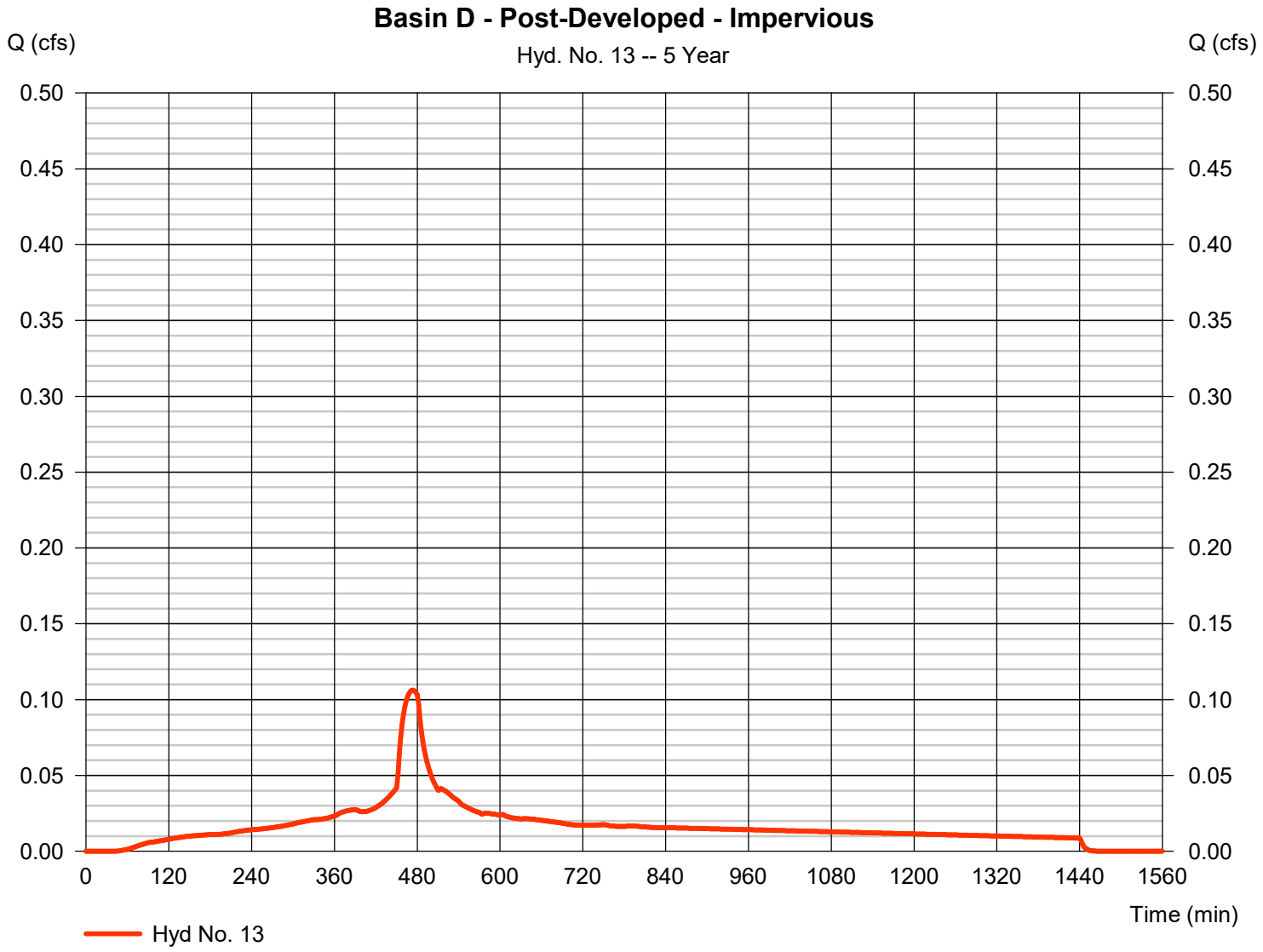


Hydrograph Report

Hyd. No. 13

Basin D - Post-Developed - Impervious

Hydrograph type	=	SBUH Runoff	Peak discharge	=	0.106 cfs
Storm frequency	=	5 yrs	Time to peak	=	474 min
Time interval	=	2 min	Hyd. volume	=	1,530 cuft
Drainage area	=	0.147 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	3.10 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a

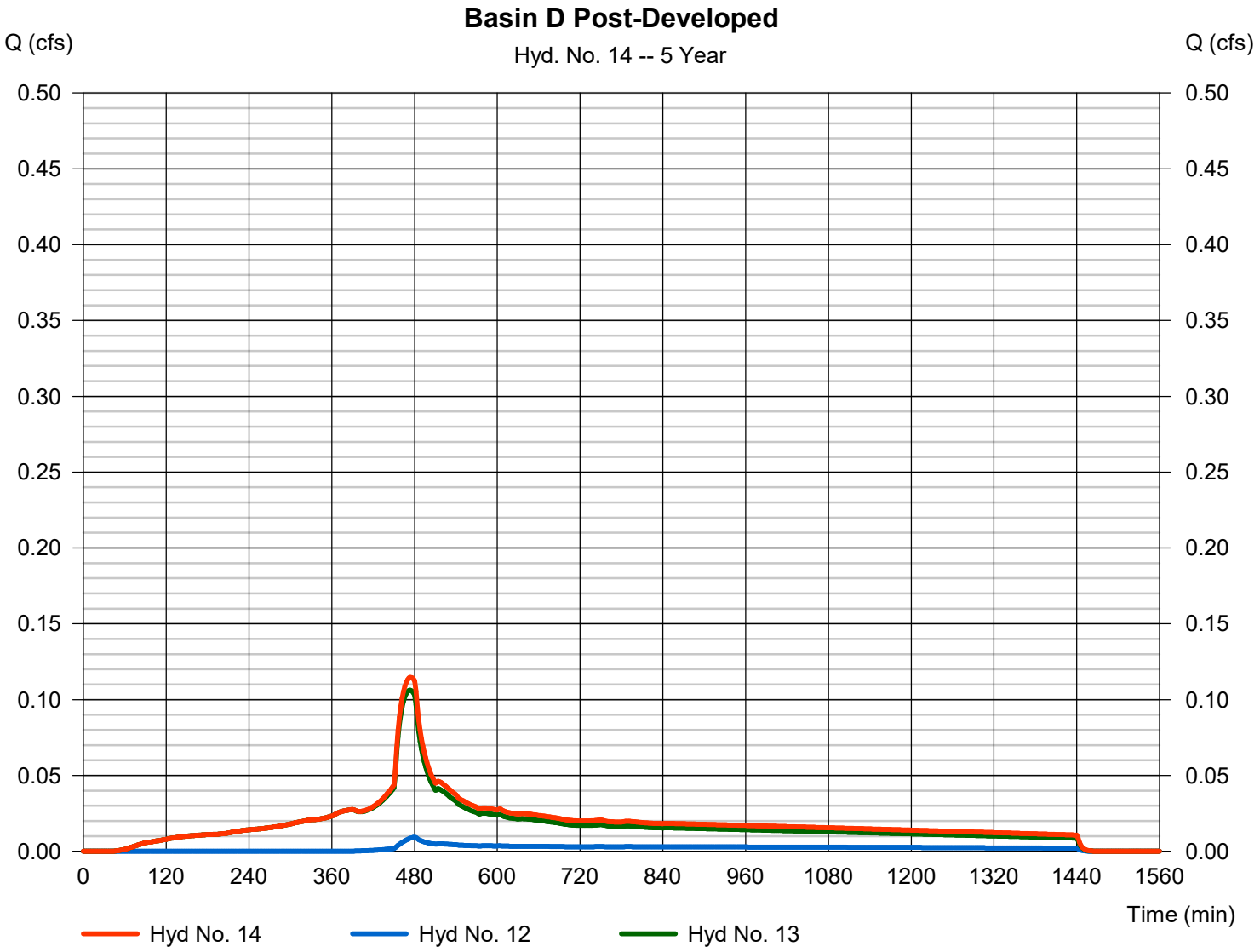


Hydrograph Report

Hyd. No. 14

Basin D Post-Developed

Hydrograph type	= Combine	Peak discharge	= 0.115 cfs
Storm frequency	= 5 yrs	Time to peak	= 474 min
Time interval	= 2 min	Hyd. volume	= 1,714 cuft
Inflow hyds.	= 12, 13	Contrib. drain. area	= 0.199 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

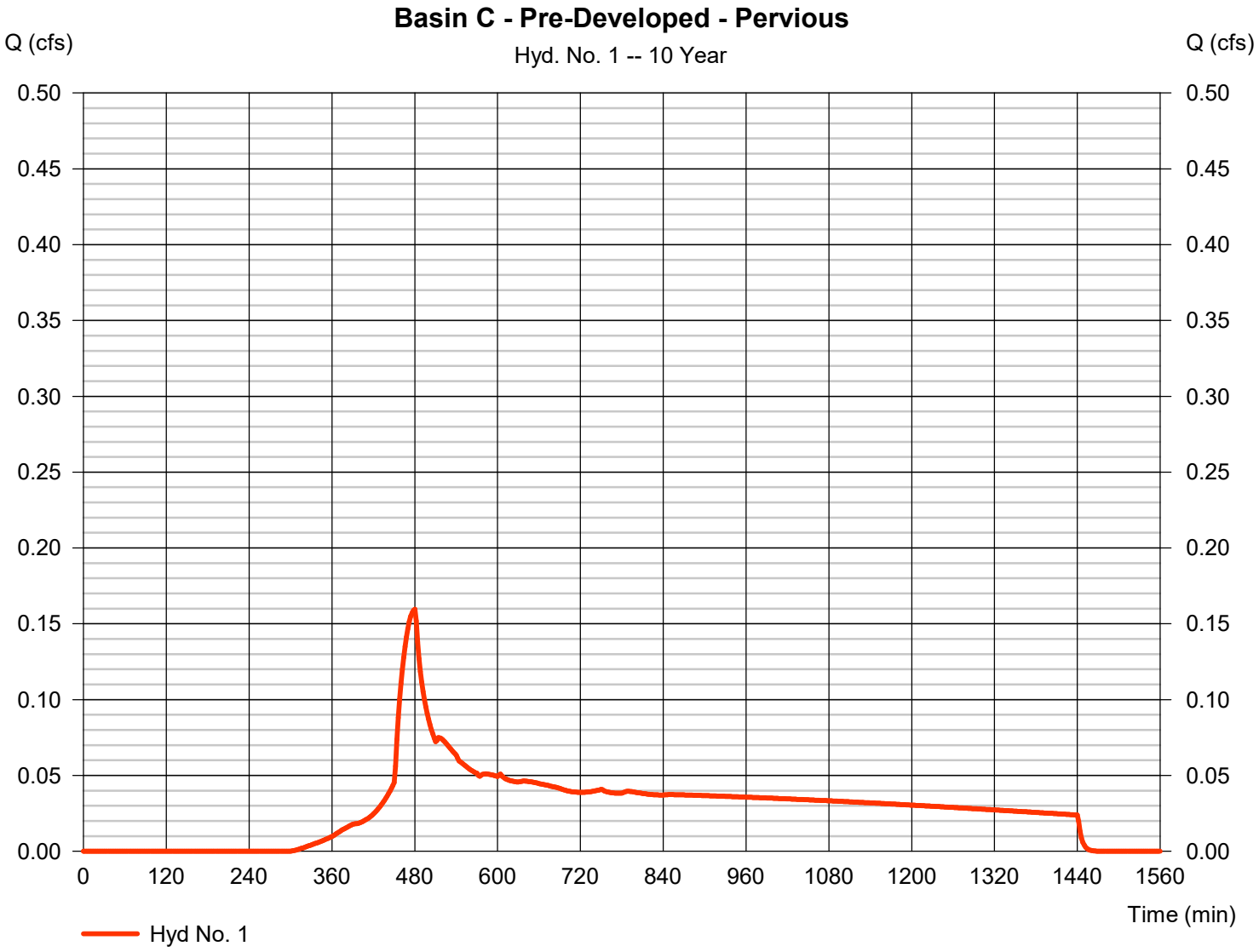
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SBUH Runoff	0.160	2	480	2,600	------	------	------	Basin C - Pre-Developed - Pervious
2	SBUH Runoff	0.065	2	474	946	------	------	------	Basin C - Pre-Developed - Impervious
3	Combine	0.223	2	478	3,546	1, 2	------	------	Basin C Pre-Developed
4	SBUH Runoff	0.047	2	480	760	------	------	------	Basin D - Pre-Developed - Pervious
5	SBUH Runoff	0.049	2	474	712	------	------	------	Basin D - Pre-Developed - Impervious
6	Combine	0.095	2	476	1,472	4, 5	------	------	Basin D Pre-Developed
8	SBUH Runoff	0.075	2	480	1,387	------	------	------	Basin C - Post-Developed - Pervious
9	SBUH Runoff	0.188	2	474	2,721	------	------	------	Basin C - Post-Developed - Imperviou
10	Combine	0.260	2	476	4,108	8, 9	------	------	Basin C Post-Developed
12	SBUH Runoff	0.012	2	480	228	------	------	------	Basin D - Post-Developed - Pervious
13	SBUH Runoff	0.119	2	474	1,716	------	------	------	Basin D - Post-Developed - Imperviou
14	Combine	0.130	2	474	1,944	12, 13	------	------	Basin D Post-Developed

Hydrograph Report

Hyd. No. 1

Basin C - Pre-Developed - Pervious

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.160 cfs
Storm frequency	= 10 yrs	Time to peak	= 480 min
Time interval	= 2 min	Hyd. volume	= 2,600 cuft
Drainage area	= 0.469 ac	Curve number	= 79
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.45 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

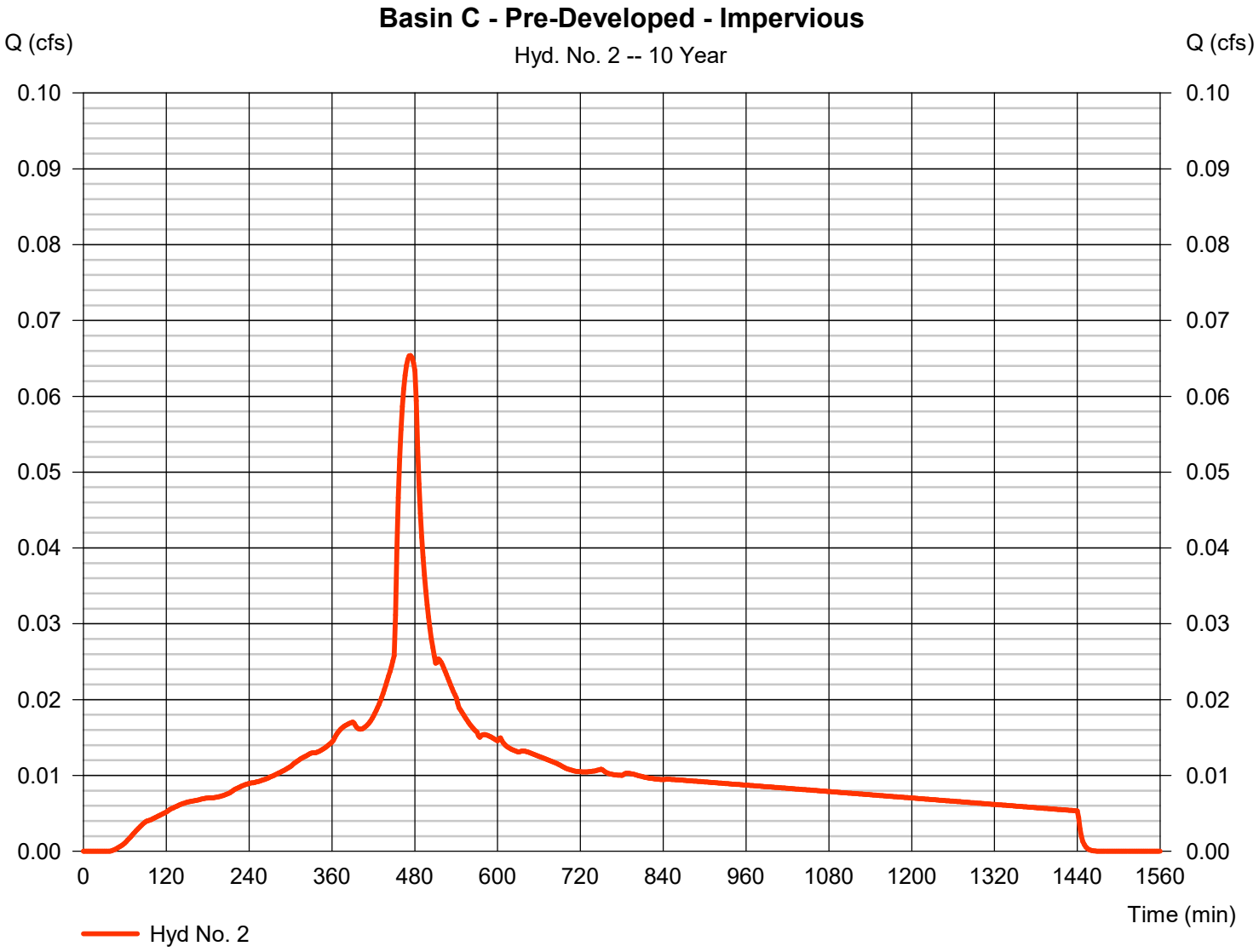


Hydrograph Report

Hyd. No. 2

Basin C - Pre-Developed - Impervious

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.065 cfs
Storm frequency	= 10 yrs	Time to peak	= 474 min
Time interval	= 2 min	Hyd. volume	= 946 cuft
Drainage area	= 0.081 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.45 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

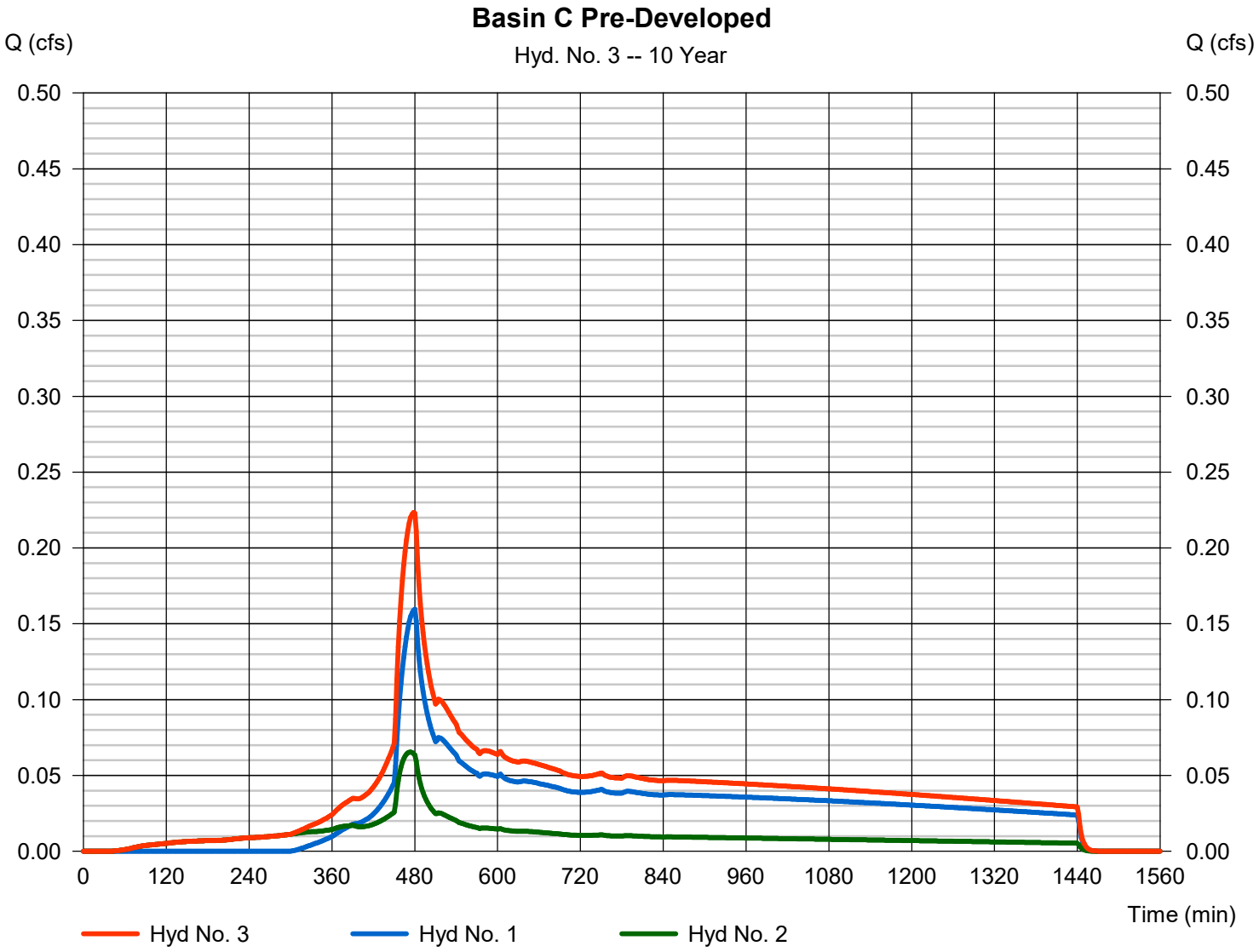


Hydrograph Report

Hyd. No. 3

Basin C Pre-Developed

Hydrograph type	=	Combine	Peak discharge	=	0.223 cfs
Storm frequency	=	10 yrs	Time to peak	=	478 min
Time interval	=	2 min	Hyd. volume	=	3,546 cuft
Inflow hyds.	=	1, 2	Contrib. drain. area	=	0.550 ac

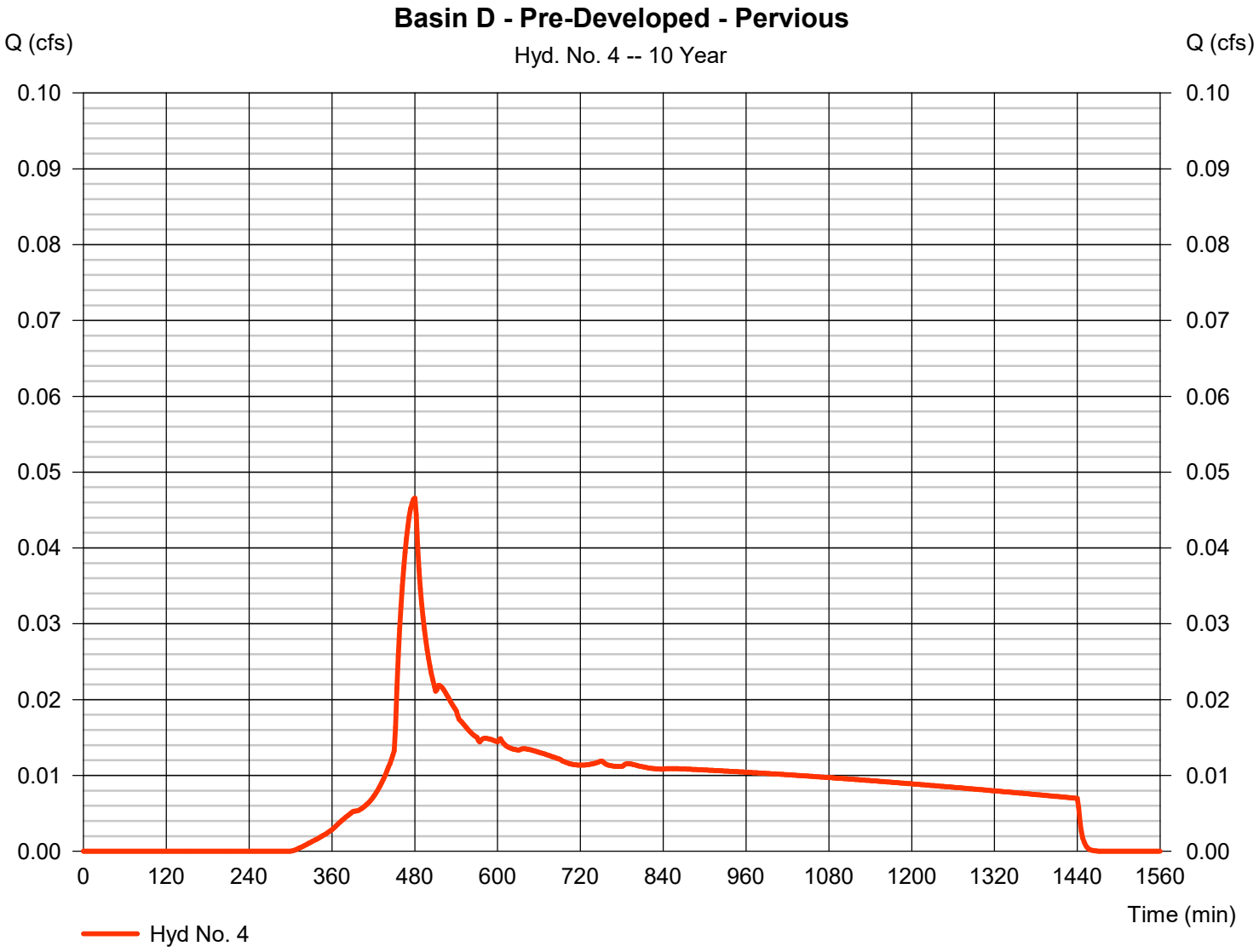


Hydrograph Report

Hyd. No. 4

Basin D - Pre-Developed - Pervious

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.047 cfs
Storm frequency	= 10 yrs	Time to peak	= 480 min
Time interval	= 2 min	Hyd. volume	= 760 cuft
Drainage area	= 0.137 ac	Curve number	= 79
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.45 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

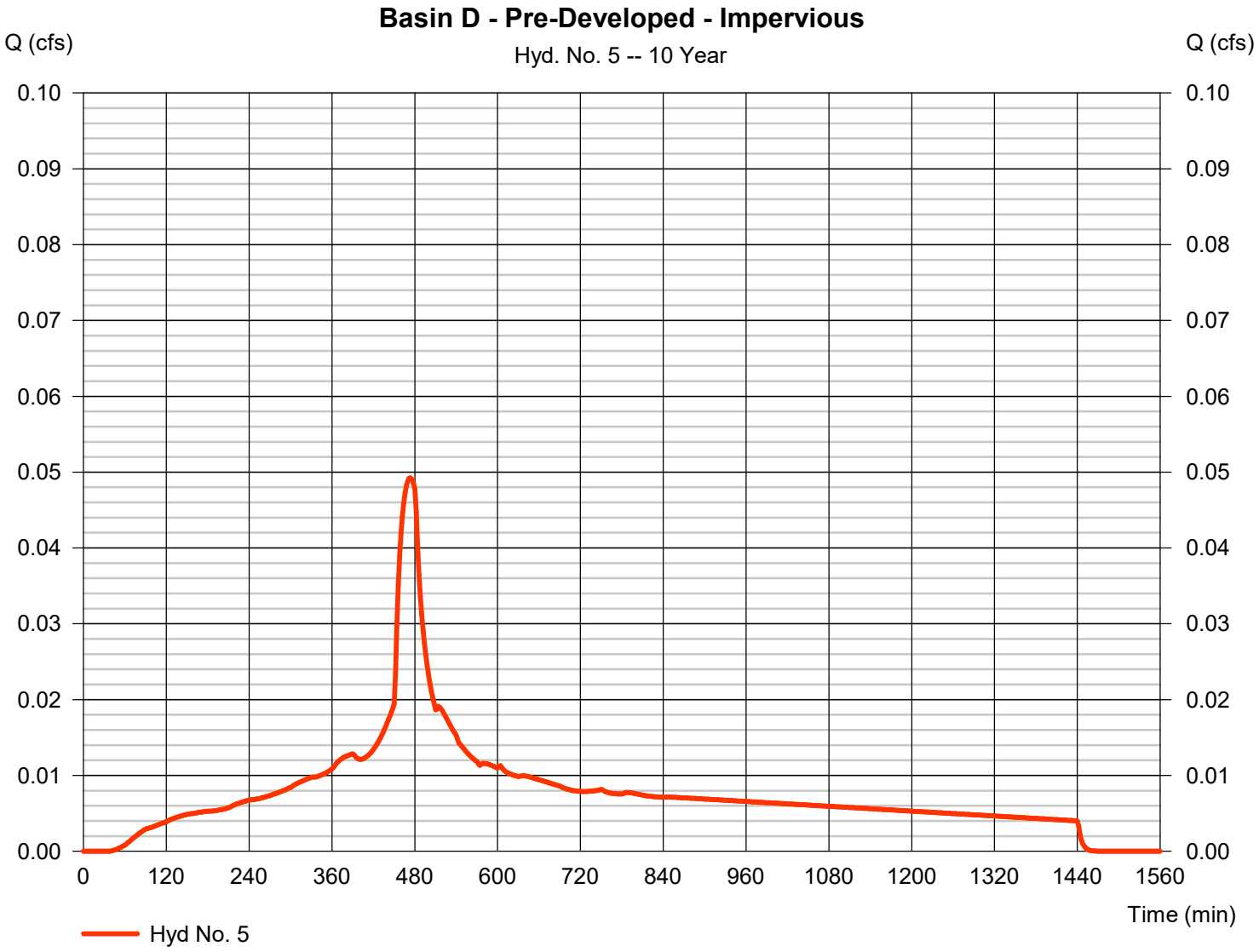


Hydrograph Report

Hyd. No. 5

Basin D - Pre-Developed - Impervious

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.049 cfs
Storm frequency	= 10 yrs	Time to peak	= 474 min
Time interval	= 2 min	Hyd. volume	= 712 cuft
Drainage area	= 0.061 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.45 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

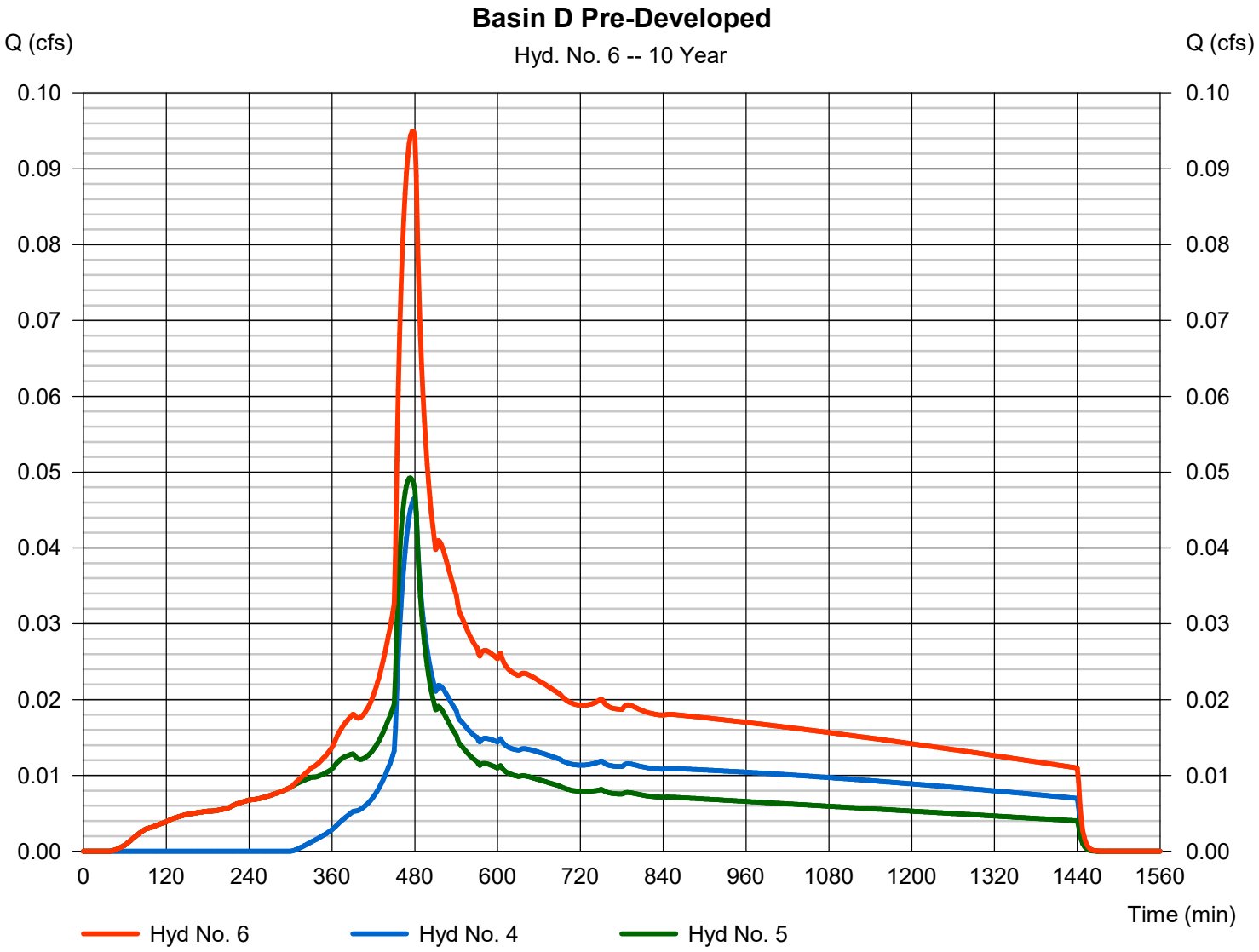


Hydrograph Report

Hyd. No. 6

Basin D Pre-Developed

Hydrograph type	= Combine	Peak discharge	= 0.095 cfs
Storm frequency	= 10 yrs	Time to peak	= 476 min
Time interval	= 2 min	Hyd. volume	= 1,472 cuft
Inflow hyds.	= 4, 5	Contrib. drain. area	= 0.198 ac

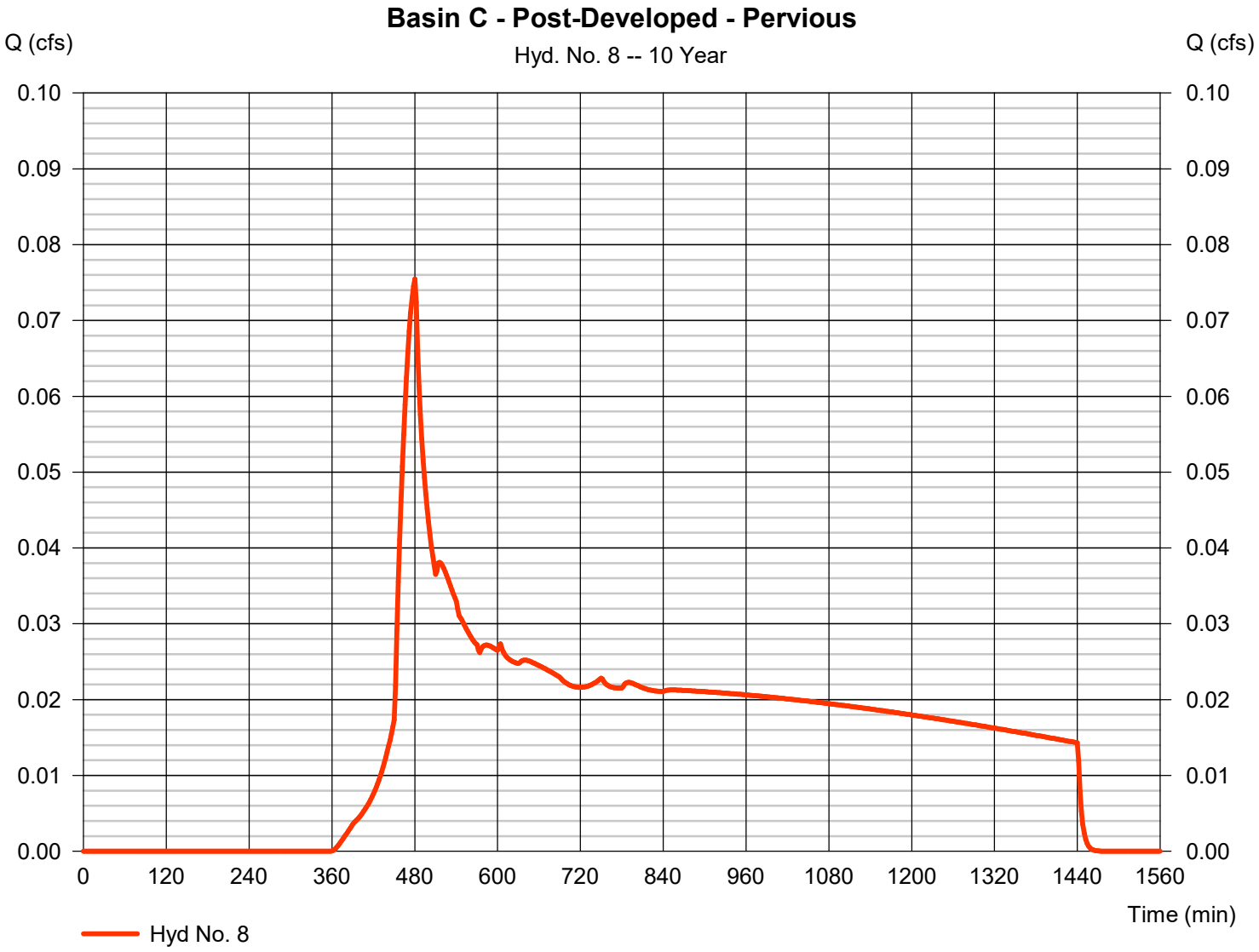


Hydrograph Report

Hyd. No. 8

Basin C - Post-Developed - Pervious

Hydrograph type	=	SBUH Runoff	Peak discharge	=	0.075 cfs
Storm frequency	=	10 yrs	Time to peak	=	480 min
Time interval	=	2 min	Hyd. volume	=	1,387 cuft
Drainage area	=	0.317 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	3.45 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a

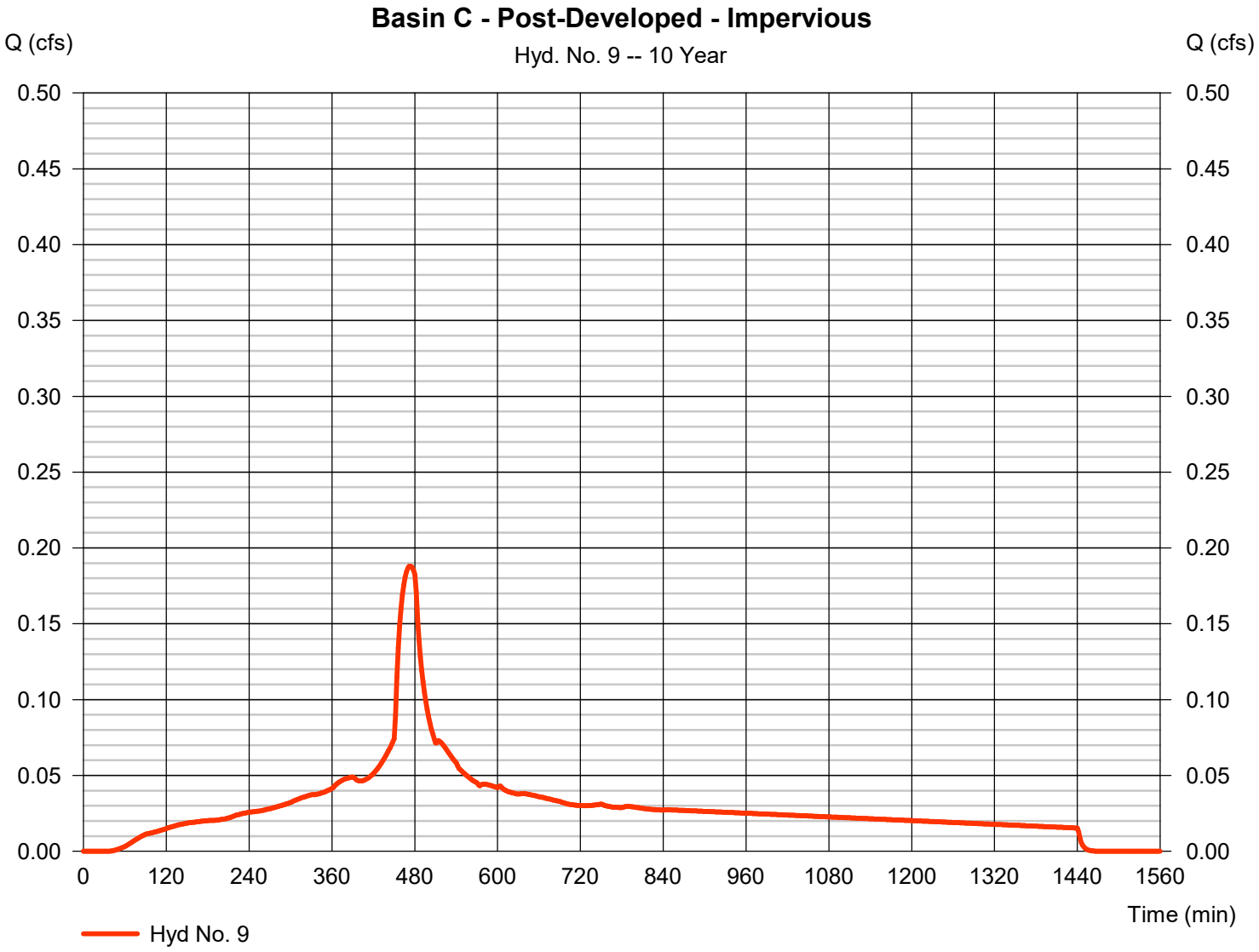


Hydrograph Report

Hyd. No. 9

Basin C - Post-Developed - Impervious

Hydrograph type	=	SBUH Runoff	Peak discharge	=	0.188 cfs
Storm frequency	=	10 yrs	Time to peak	=	474 min
Time interval	=	2 min	Hyd. volume	=	2,721 cuft
Drainage area	=	0.233 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	3.45 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a

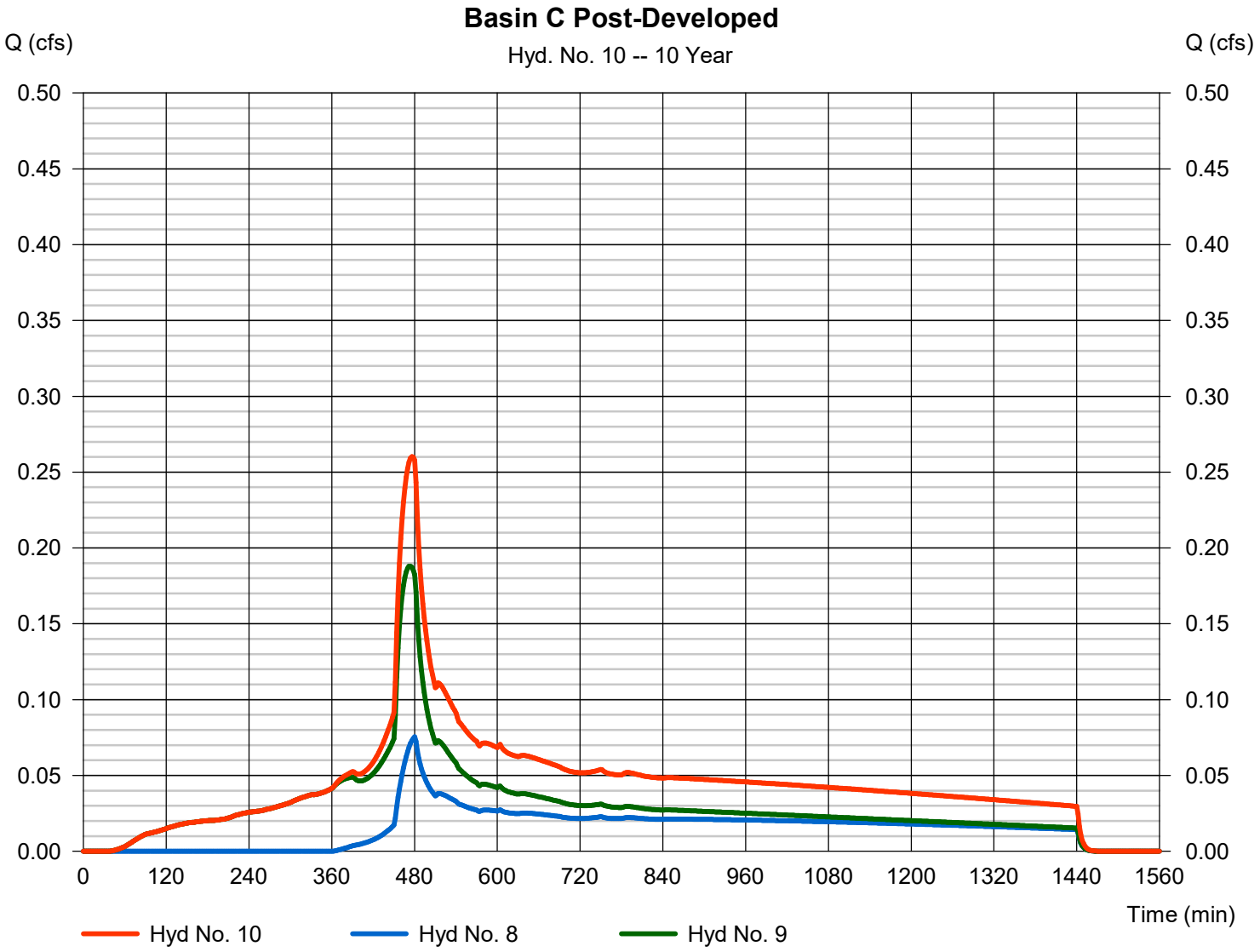


Hydrograph Report

Hyd. No. 10

Basin C Post-Developed

Hydrograph type	=	Combine	Peak discharge	=	0.260 cfs
Storm frequency	=	10 yrs	Time to peak	=	476 min
Time interval	=	2 min	Hyd. volume	=	4,108 cuft
Inflow hyds.	=	8, 9	Contrib. drain. area	=	0.550 ac

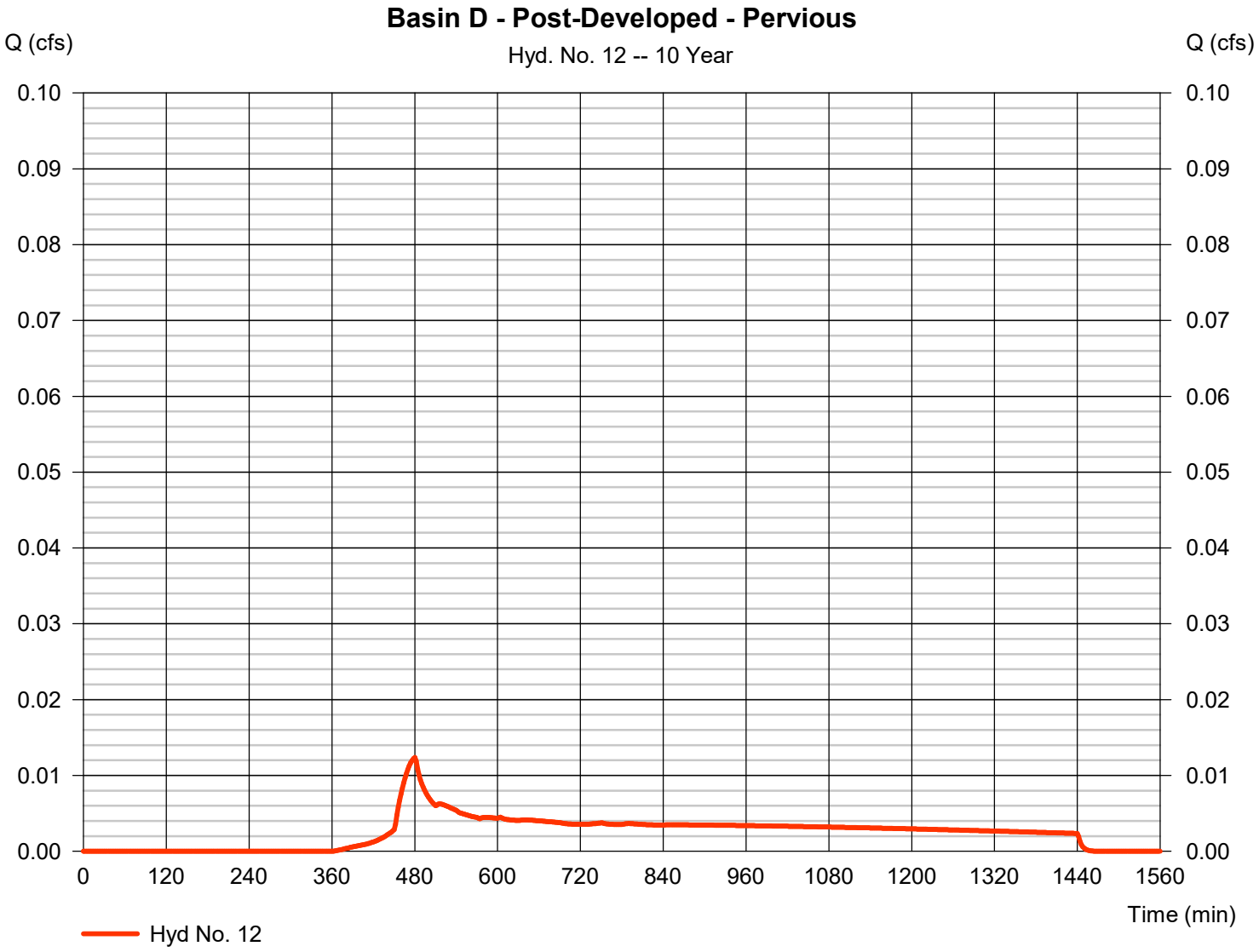


Hydrograph Report

Hyd. No. 12

Basin D - Post-Developed - Pervious

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.012 cfs
Storm frequency	= 10 yrs	Time to peak	= 480 min
Time interval	= 2 min	Hyd. volume	= 228 cuft
Drainage area	= 0.052 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.45 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

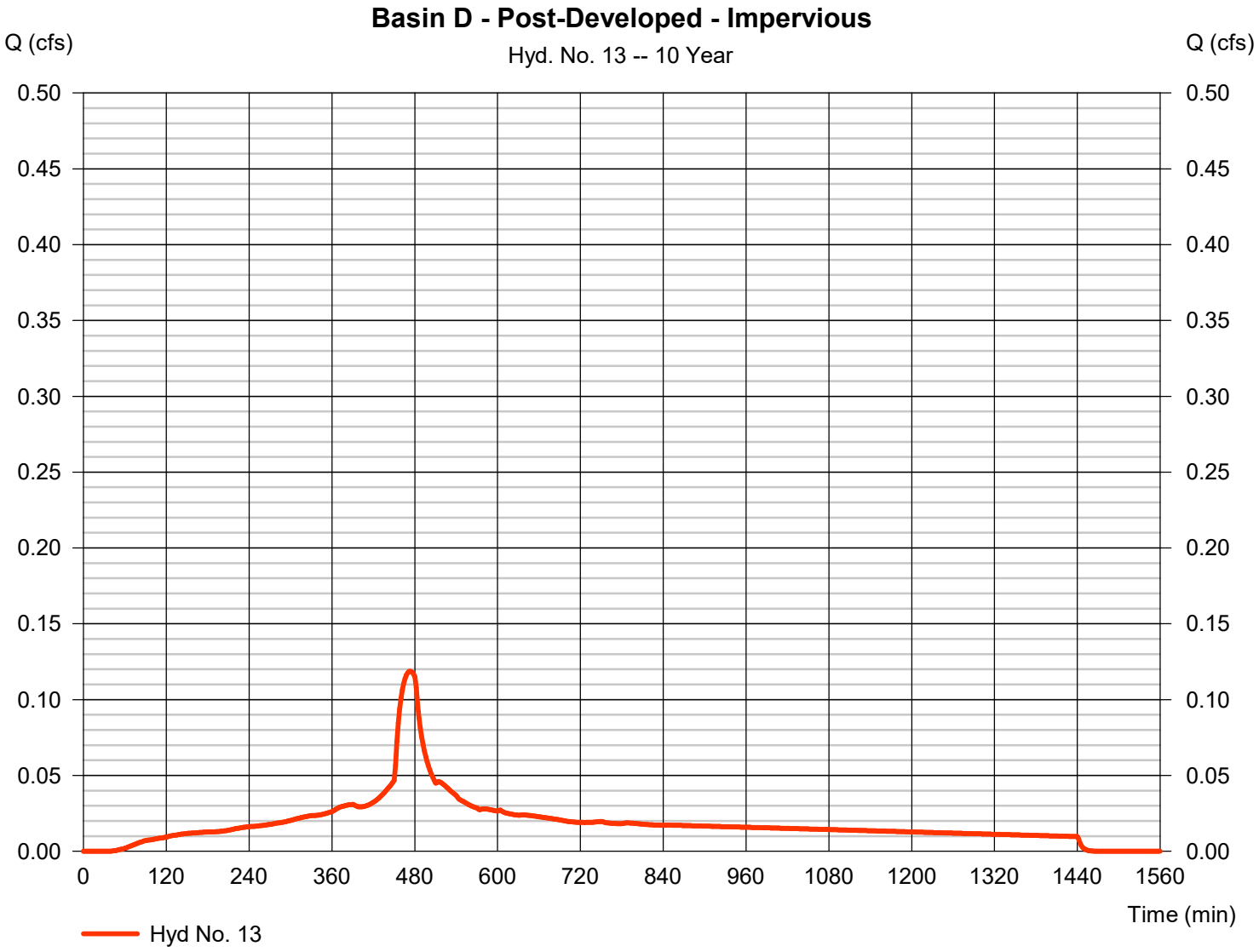


Hydrograph Report

Hyd. No. 13

Basin D - Post-Developed - Impervious

Hydrograph type	=	SBUH Runoff	Peak discharge	=	0.119 cfs
Storm frequency	=	10 yrs	Time to peak	=	474 min
Time interval	=	2 min	Hyd. volume	=	1,716 cuft
Drainage area	=	0.147 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	3.45 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a

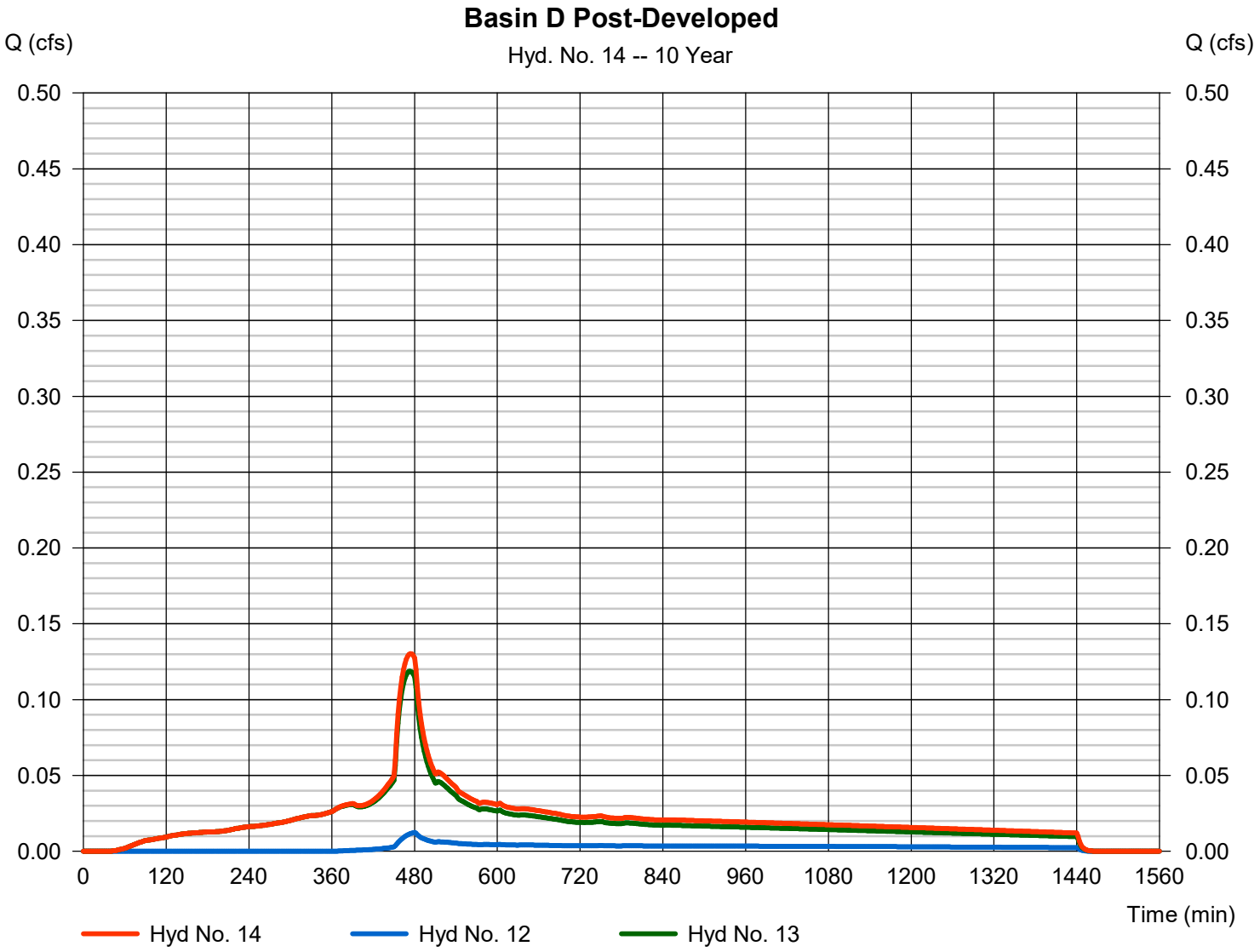


Hydrograph Report

Hyd. No. 14

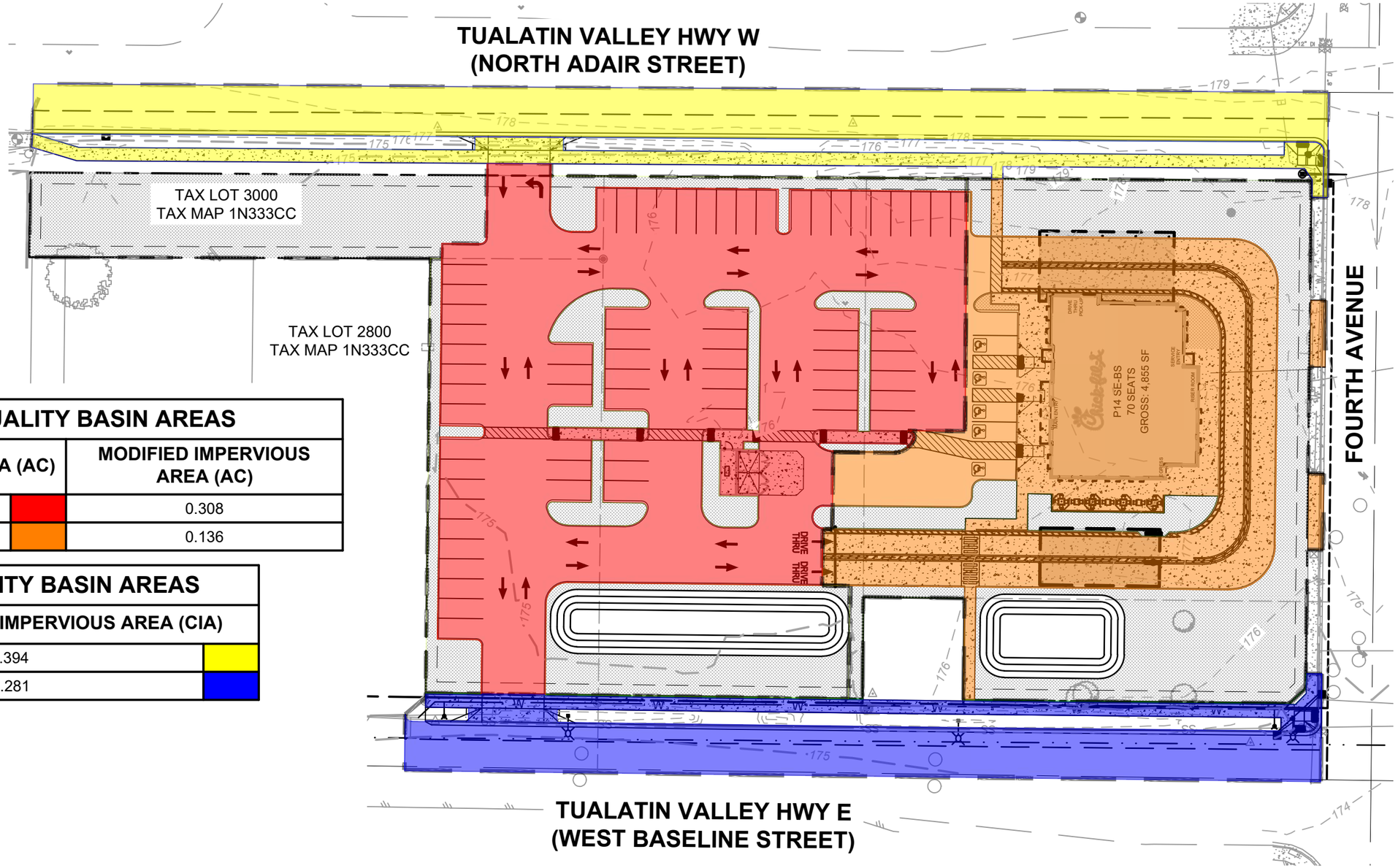
Basin D Post-Developed

Hydrograph type	=	Combine	Peak discharge	=	0.130 cfs
Storm frequency	=	10 yrs	Time to peak	=	474 min
Time interval	=	2 min	Hyd. volume	=	1,944 cuft
Inflow hyds.	=	12, 13	Contrib. drain. area	=	0.199 ac



APPENDIX E:

WATER QUALITY CALCS



ONSITE WATER QUALITY BASIN AREAS			
BASIN	NEW IMPERVIOUS AREA (AC)		MODIFIED IMPERVIOUS AREA (AC)
A	0.523		0.308
B	0.441		0.136

OFFSITE WATER QUALITY BASIN AREAS		
BASIN	CONTRIBUTING IMPERVIOUS AREA (CIA)	
C	0.394	
D	0.281	

N

50 0 50 100

SCALE IN FEET

DOWL
WWW.DOWL.COM

CHICK-FIL-A CORNELIUS
WATER QUALITY BASIN MAP
CORNELIUS, OREGON

PROJECT	16076
DATE	09/05/2024

FIG. 4

C:\dowl_pw\d0417267\FIG.4 - WATER QUALITY BASIN MAP.dwg PLOT DATE 2024-9-5 15:28 SAVED DATE 2024-09-05 15:28 USER: drommel

Pre-Developed

Basin	Pervious Area		Impervious Area		Total Area		tc (min)	Q_{2yr} (cfs)	Q_{5yr} (cfs)	Q_{10yr} (cfs)	Q_{25yr} (cfs)
	sf	ac	sf	ac	sf	ac					
Basin A	36,237	0.832	13,425	0.308	49,662	1.140	5.0	0.307	0.443	0.527	0.639
Basin B	35,634	0.818	5,924	0.136	41,558	0.954	5.0	0.208	0.317	0.385	0.477
Basin C	20,433	0.469	3,529	0.081	23,961	0.550	5.0	0.121	0.184	0.223	0.276
Basin D	5,989	0.137	2,665	0.061	8,654	0.199	5.0	0.056	0.080	0.095	0.115
	98,293	**2.256**	**25,542**	**0.586**	**123,835**	**2.843**		**0.692**	**1.024**	**1.230**	**1.507**

Post-Developed

Basin	Pervious Area		Impervious Area		Total Area		tc (min)	Q_{2yr} (cfs)	Q_{5yr} (cfs)	Q_{10yr} (cfs)	Q_{25yr} (cfs)
	sf	ac	sf	ac	sf	ac					
Basin A	13,447	0.309	36,215	0.831	49,662	1.140	5.0	0.502	0.651	0.740	0.856
Basin B	16,430	0.377	25,128	0.577	41,558	0.954	5.0	0.361	0.479	0.550	0.644
Basin C	13,799	0.317	10,162	0.233	23,961	0.550	5.0	0.159	0.222	0.260	0.312
Basin D	2,250	0.052	6,404	0.147	8,654	0.199	5.0	0.089	0.115	0.130	0.151
	45,926	**1.054**	**77,909**	**1.789**	**123,835**	**2.843**		**1.111**	**1.467**	**1.680**	**1.963**

Post-Developed Detained Basins

Basin	Q_{2yr} (cfs)		Q_{5yr} (cfs)		Q_{10yr} (cfs)		Q_{25yr} (cfs)	
	Target	Actual	**Target**	Actual	**Target**	Actual	**Target**	Actual
Basin A	**0.154**	0.145	**0.443**	0.193	**0.527**	0.271	**0.639**	0.396
Basin B	**0.104**	0.100	**0.317**	0.136	**0.385**	0.154	**0.477**	0.251
Basin C	**0.061**	0.172	**0.184**	0.238	**0.223**	0.279	**0.276**	0.332
Basin D	**0.028**	0.089	**0.080**	0.115	**0.095**	0.130	**0.115**	0.151
	0.346	**0.506**	**1.024**	**0.682**	**1.230**	**0.834**	**1.507**	**1.130**

Water Quality

Basin	New Pervious Area (ac)	New Impervious Area (ac)	Modified Impervious Area (ac)	Permanently Removed Impervious (ac)	CWS WQ Area (ac)	CWS Water Volume (cf)	CWS Water Quality Flow (cfs)	CWS Orifice Size (in)
Basin A	0.309	0.523	0.308	0.00	1.448	1891.93	0.1314	**2.4**
Basin B	0.377	0.441	0.136	0.00	0.849	1109.30	0.0770	**1.1**
Basin C - Adair St	0.317	0.152	0.081	0.00	0.395	516.56	0.0359	0.000
Basin D - Baseline St	0.052	0.086	0.061	0.00	0.269	352.02	0.0244	0.000

Basin	Water Quality Flow Rate (cfs)	18" Cartridge Flow Rate (gpm)	27" Cartridge Flow Rate (gpm)	18" Cartridge Flow Rate (cfs)	27" Cartridge Flow Rate (cfs)	**No. of 18" Cartridges**
C	0.0359	15	22.5	0.033	0.0501	**1.09**
D	0.0244	15	22.5	0.033	0.0501	**0.74**

Hydraflow Table of Contents

16076 - CFA Cornelius.gpw

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

Thursday, 09 / 5 / 2024

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Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

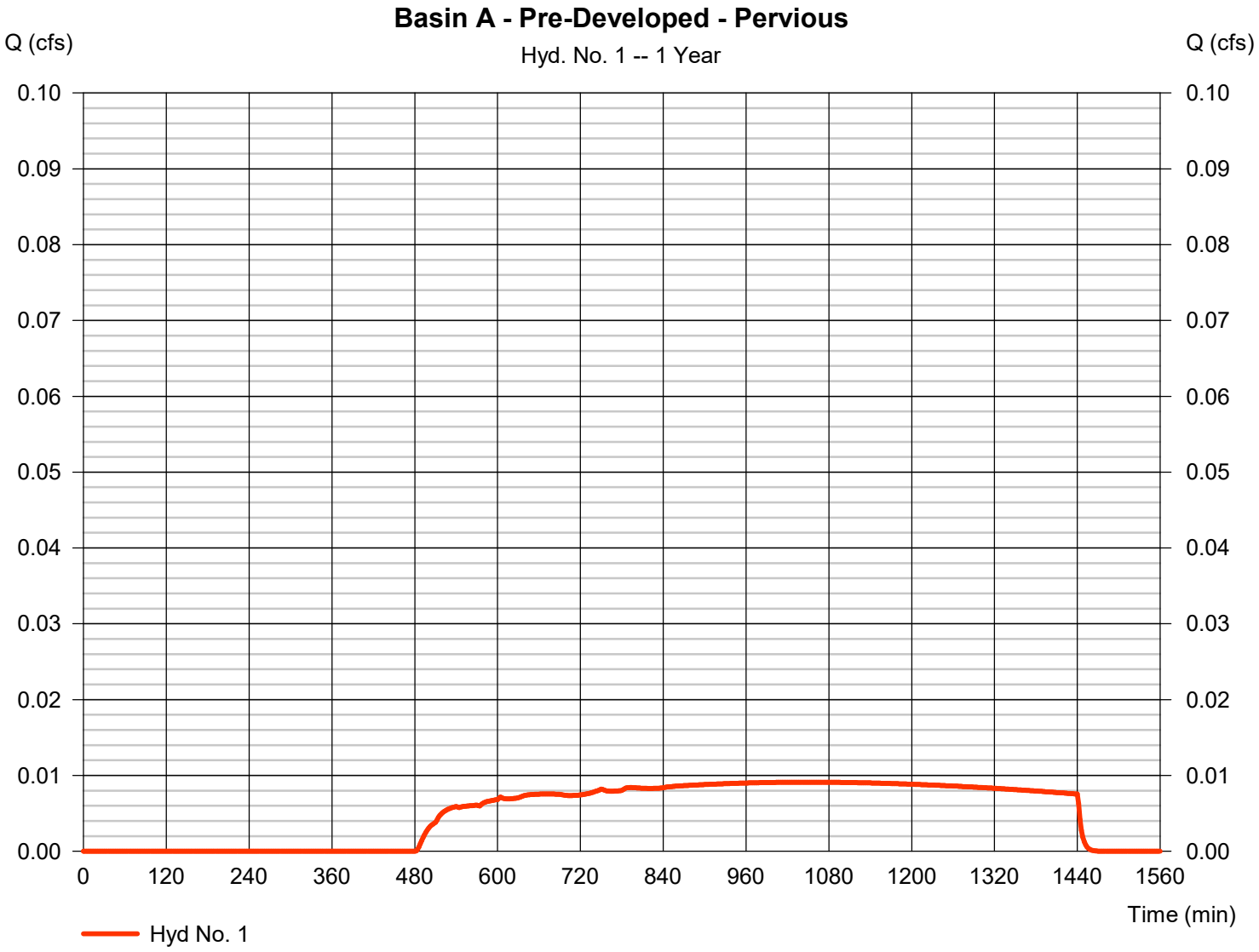
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SBUH Runoff	0.009	2	1050	462	------	------	------	Basin A - Pre-Developed - Pervious
2	SBUH Runoff	0.082	2	474	1,157	------	------	------	Basin A - Pre-Developed - Impervious
3	Combine	0.082	2	474	1,618	1, 2	------	------	Basin A Pre-Developed
4	SBUH Runoff	0.009	2	1050	454	------	------	------	Basin B - Pre-Developed - Pervious
5	SBUH Runoff	0.036	2	474	511	------	------	------	Basin B - Pre-Developed - Impervious
6	Combine	0.036	2	474	965	4, 5	------	------	Basin B Pre-Developed
8	SBUH Runoff	0.002	2	1196	83	------	------	------	Basin A - Post-Developed - Pervious
9	SBUH Runoff	0.222	2	474	3,121	------	------	------	Basin A - Post-Developed - Imperviou
10	Combine	0.222	2	474	3,204	8, 9	------	------	Basin A Post-Developed
12	SBUH Runoff	0.002	2	1196	101	------	------	------	Basin B - Post-Developed - Pervious
13	SBUH Runoff	0.154	2	474	2,167	------	------	------	Basin B - Post-Developed - Imperviou
14	Combine	0.154	2	474	2,268	12, 13	------	------	Basin B Post-Developed
16	Reservoir	0.095	2	506	2,979	10	173.54	606	Facility A
18	Reservoir	0.026	2	830	2,253	14	173.22	815	Facility B

Hydrograph Report

Hyd. No. 1

Basin A - Pre-Developed - Pervious

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.009 cfs
Storm frequency	= 1 yrs	Time to peak	= 1050 min
Time interval	= 2 min	Hyd. volume	= 462 cuft
Drainage area	= 0.832 ac	Curve number	= 79
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 1.25 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

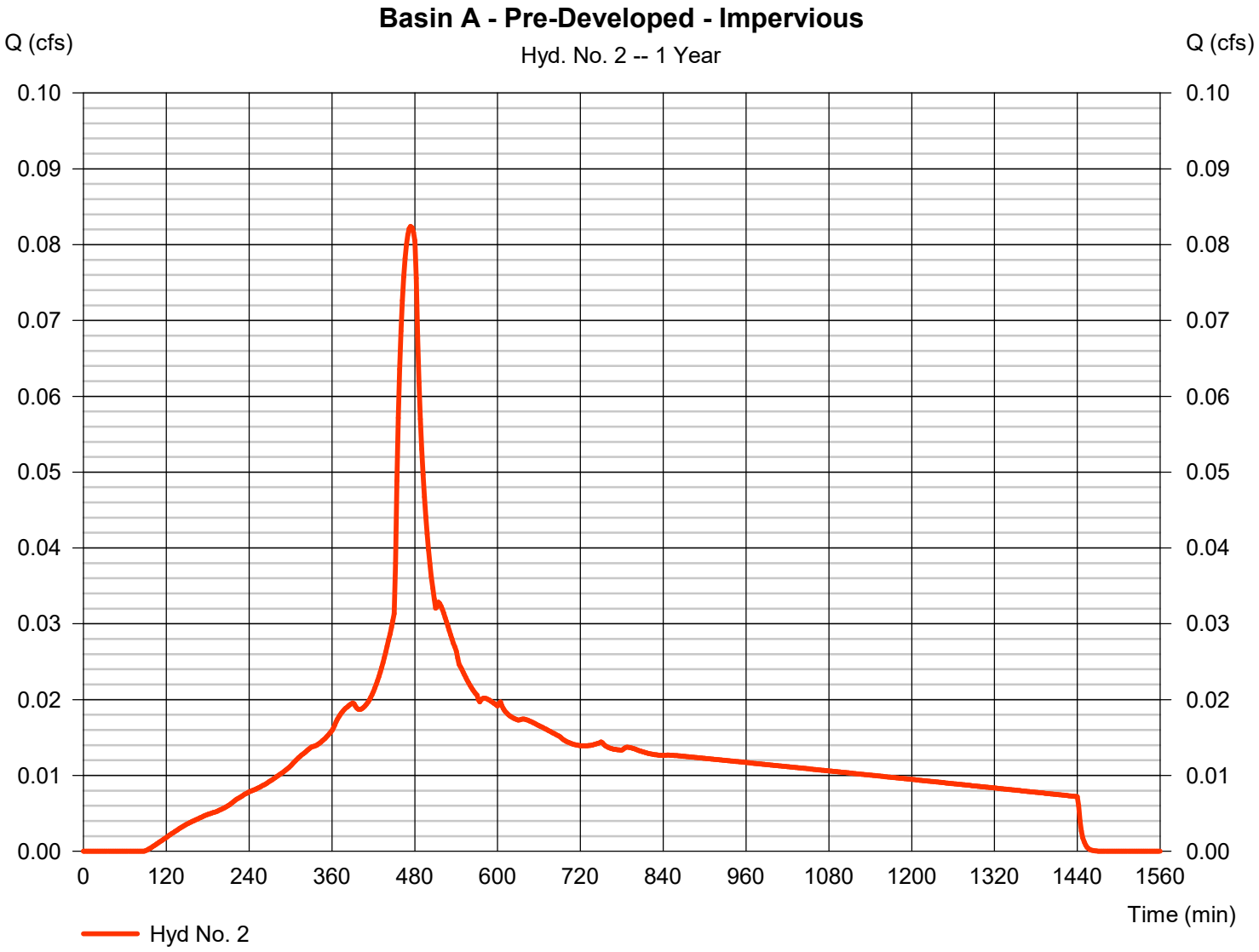


Hydrograph Report

Hyd. No. 2

Basin A - Pre-Developed - Impervious

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.082 cfs
Storm frequency	= 1 yrs	Time to peak	= 474 min
Time interval	= 2 min	Hyd. volume	= 1,157 cuft
Drainage area	= 0.308 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 1.25 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

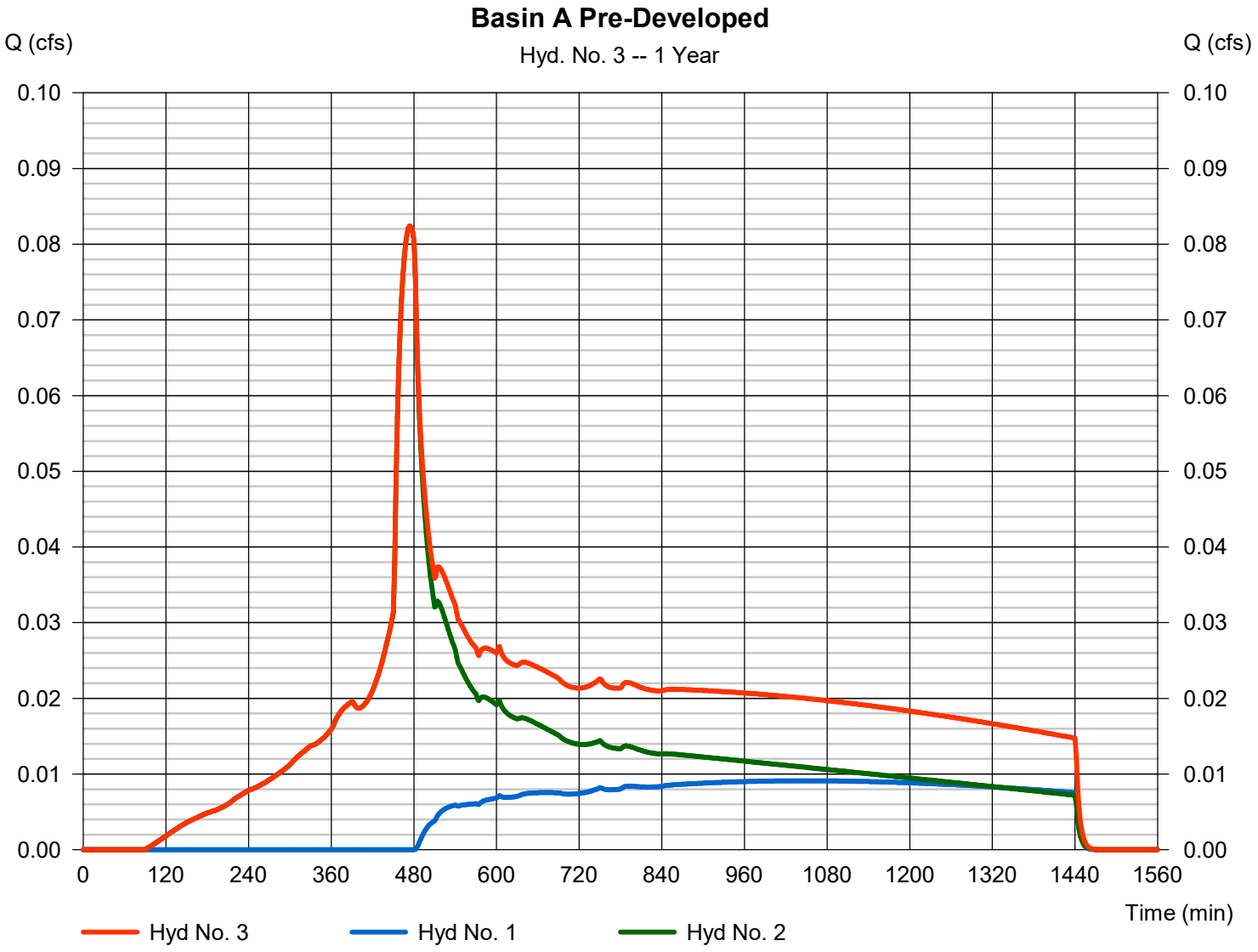


Hydrograph Report

Hyd. No. 3

Basin A Pre-Developed

Hydrograph type	=	Combine	Peak discharge	=	0.082 cfs
Storm frequency	=	1 yrs	Time to peak	=	474 min
Time interval	=	2 min	Hyd. volume	=	1,618 cuft
Inflow hyds.	=	1, 2	Contrib. drain. area	=	1.140 ac

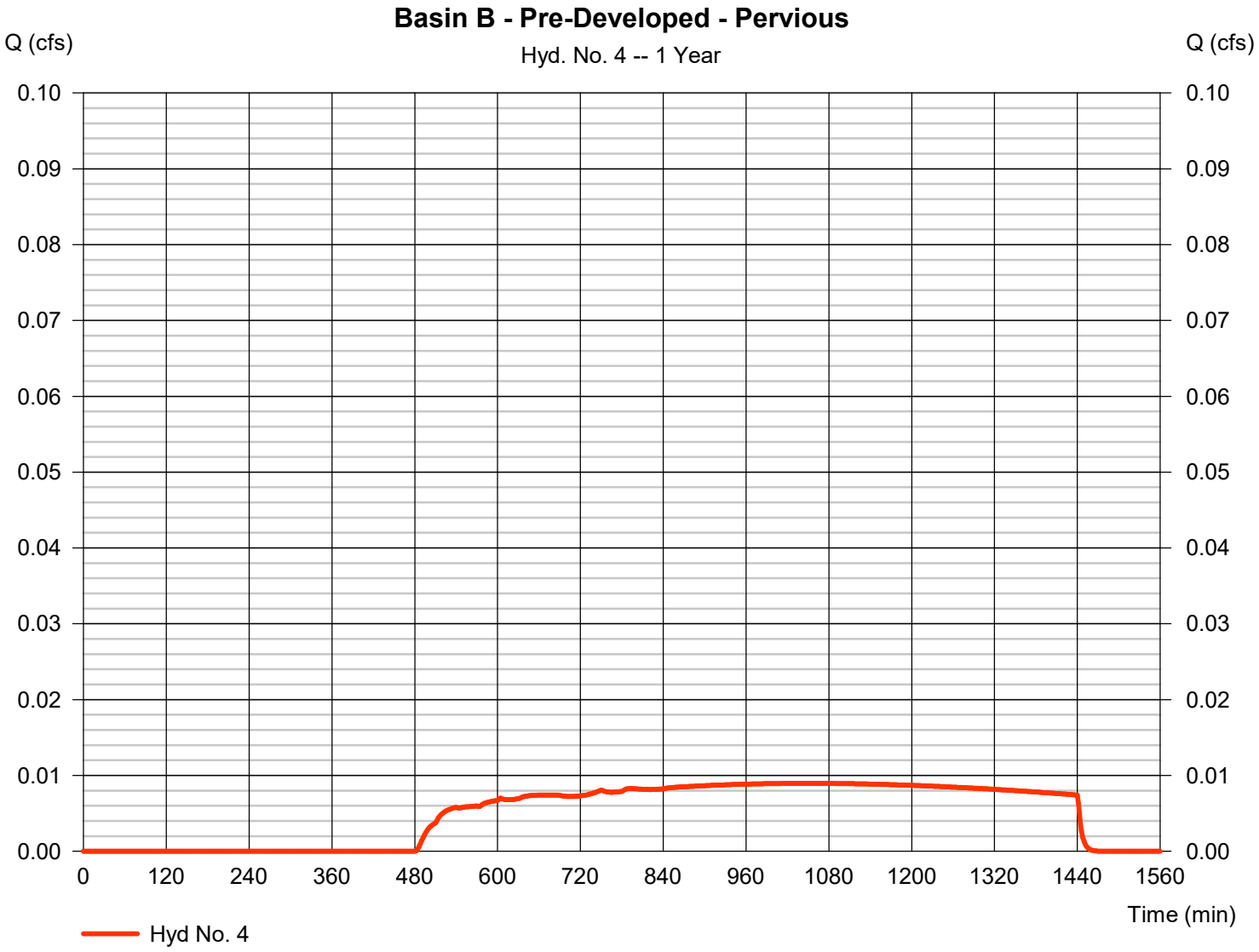


Hydrograph Report

Hyd. No. 4

Basin B - Pre-Developed - Pervious

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.009 cfs
Storm frequency	= 1 yrs	Time to peak	= 1050 min
Time interval	= 2 min	Hyd. volume	= 454 cuft
Drainage area	= 0.818 ac	Curve number	= 79
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 1.25 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

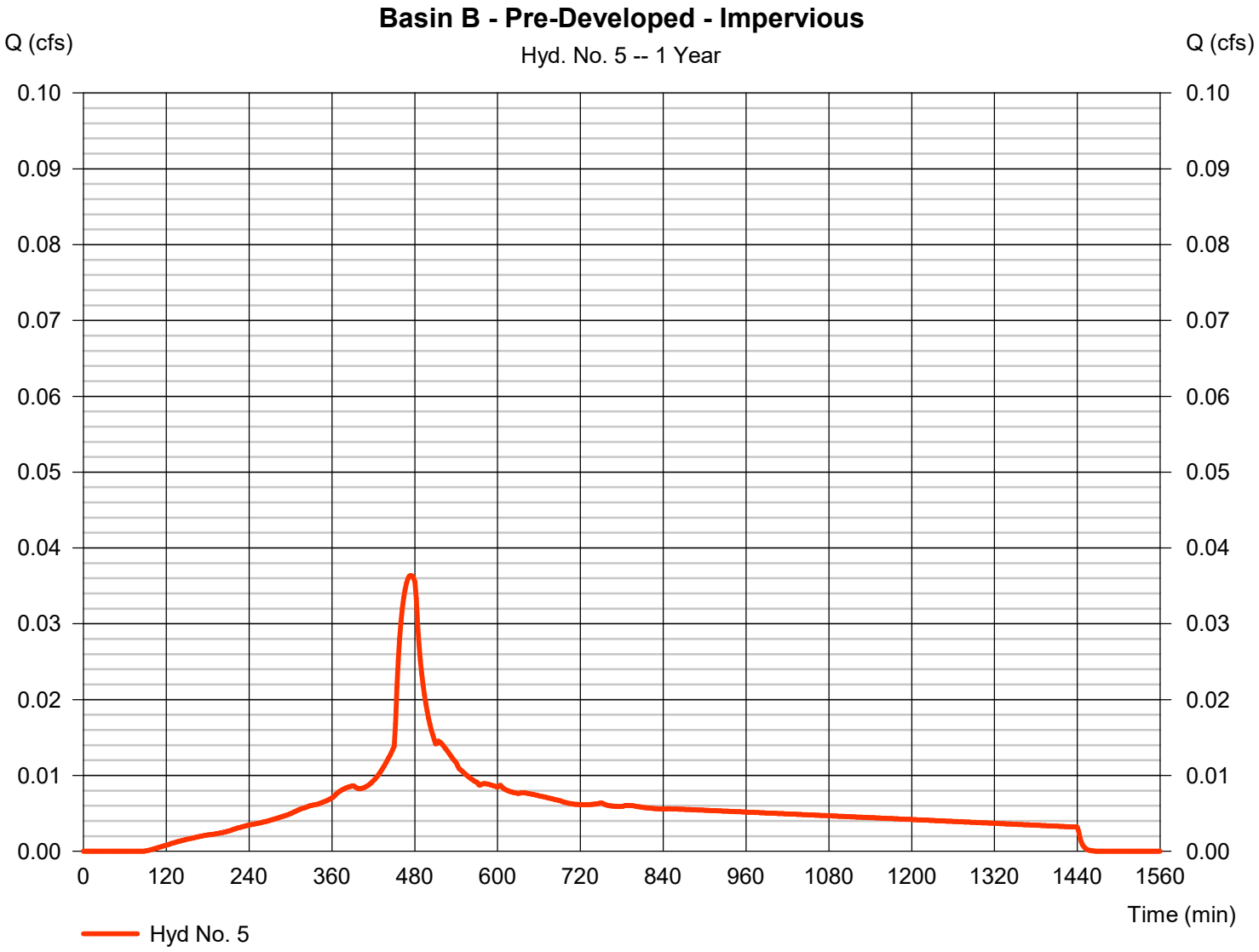


Hydrograph Report

Hyd. No. 5

Basin B - Pre-Developed - Impervious

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.036 cfs
Storm frequency	= 1 yrs	Time to peak	= 474 min
Time interval	= 2 min	Hyd. volume	= 511 cuft
Drainage area	= 0.136 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 1.25 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

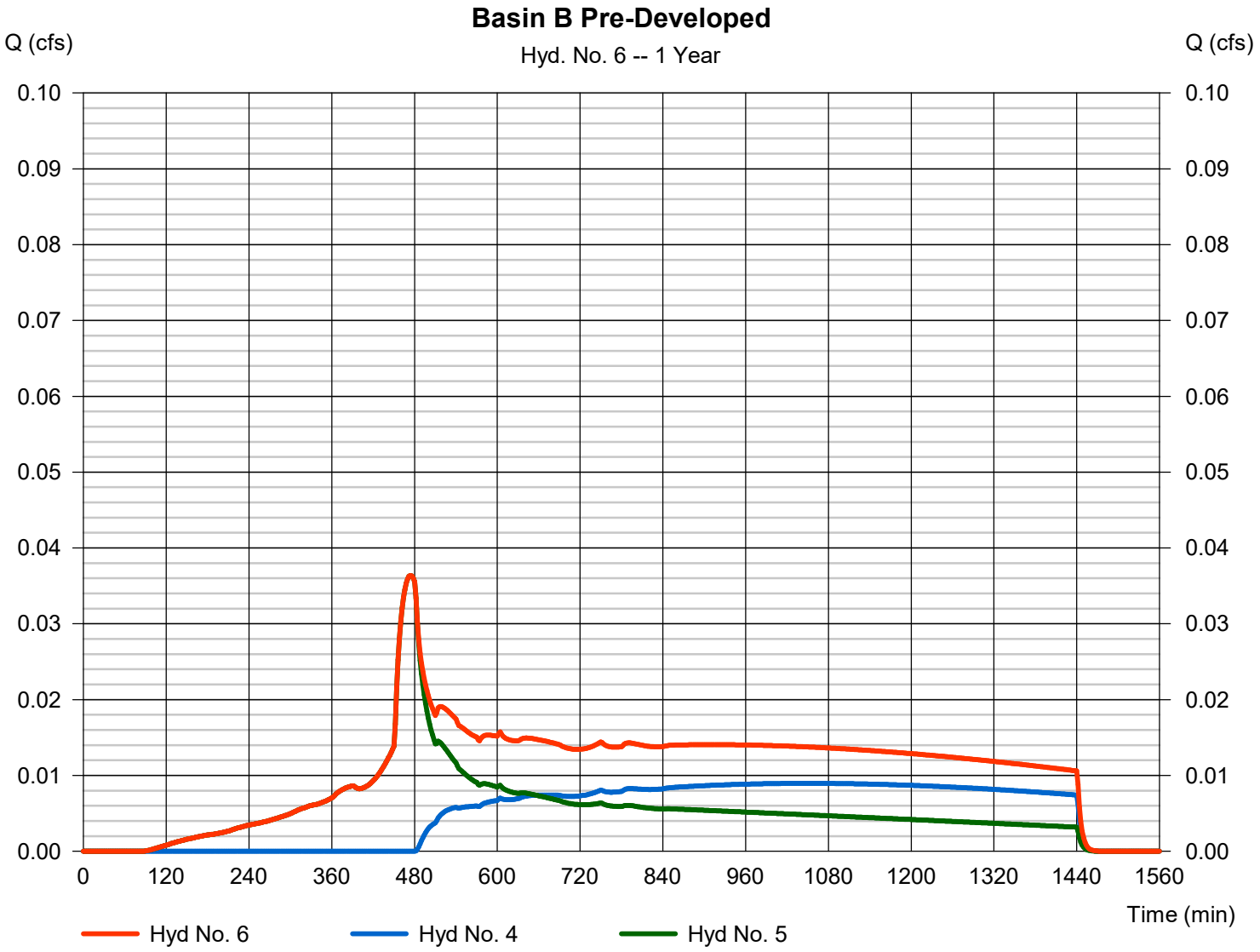


Hydrograph Report

Hyd. No. 6

Basin B Pre-Developed

Hydrograph type	= Combine	Peak discharge	= 0.036 cfs
Storm frequency	= 1 yrs	Time to peak	= 474 min
Time interval	= 2 min	Hyd. volume	= 965 cuft
Inflow hyds.	= 4, 5	Contrib. drain. area	= 0.954 ac

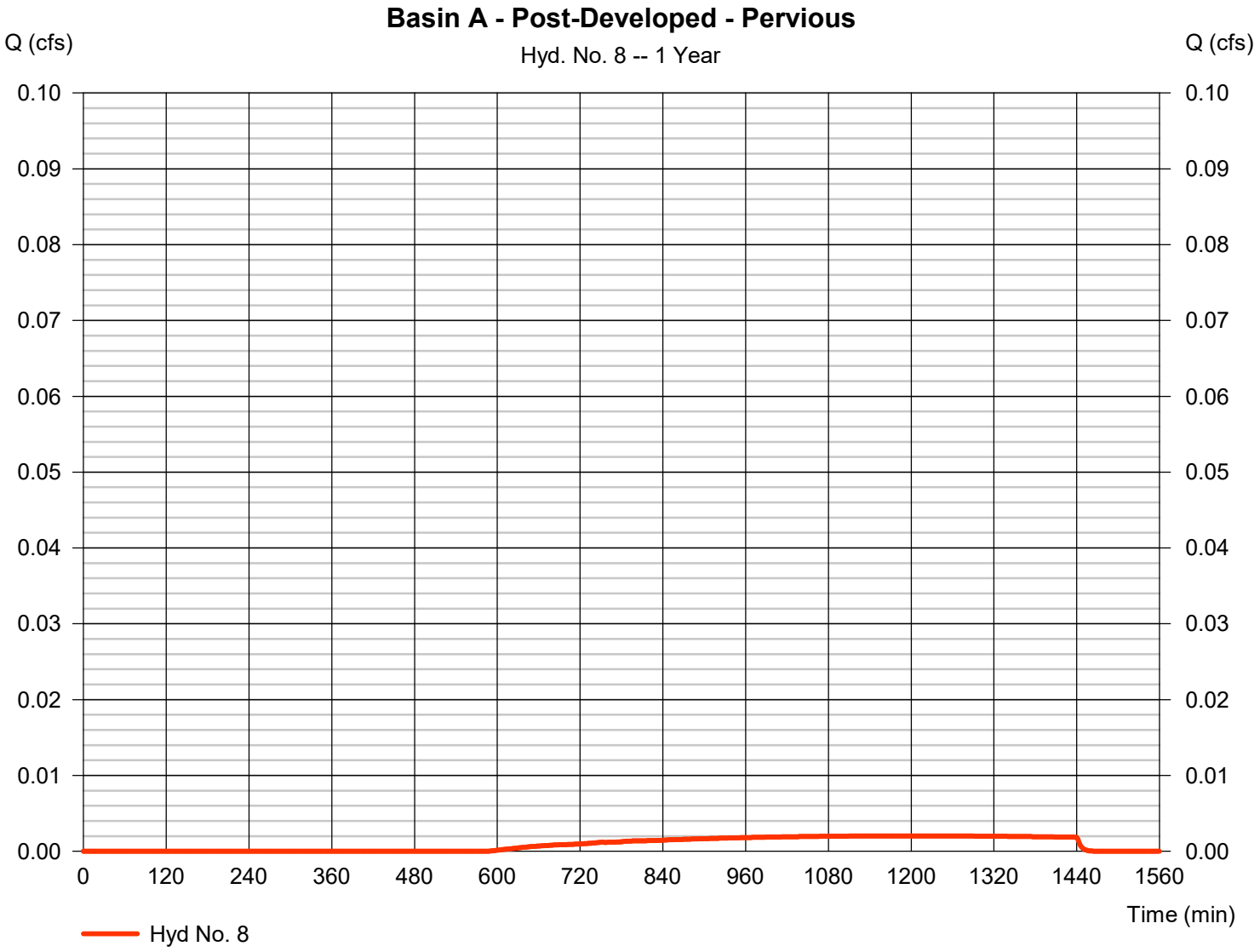


Hydrograph Report

Hyd. No. 8

Basin A - Post-Developed - Pervious

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.002 cfs
Storm frequency	= 1 yrs	Time to peak	= 1196 min
Time interval	= 2 min	Hyd. volume	= 83 cuft
Drainage area	= 0.309 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 1.25 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

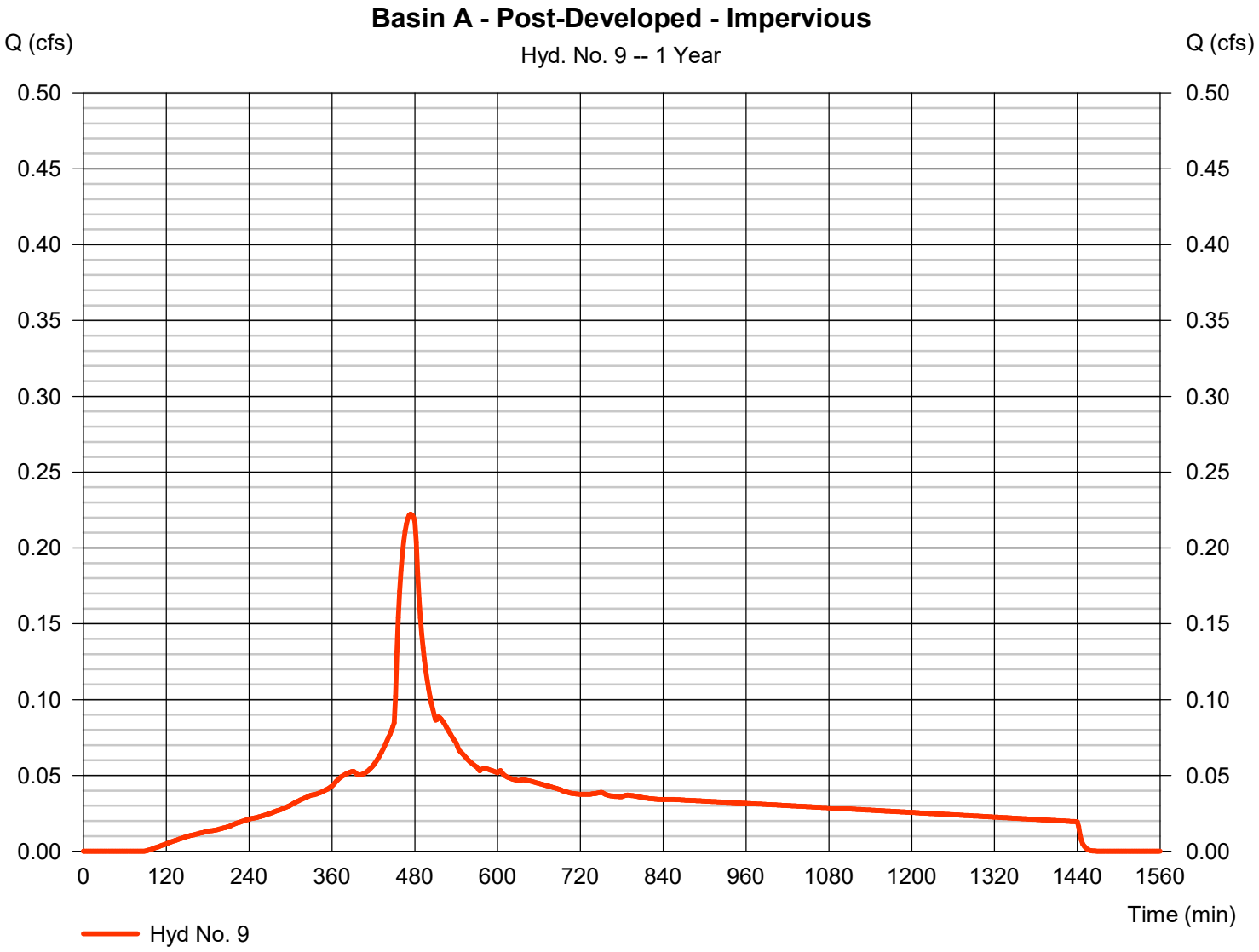


Hydrograph Report

Hyd. No. 9

Basin A - Post-Developed - Impervious

Hydrograph type	=	SBUH Runoff	Peak discharge	=	0.222 cfs
Storm frequency	=	1 yrs	Time to peak	=	474 min
Time interval	=	2 min	Hyd. volume	=	3,121 cuft
Drainage area	=	0.831 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	1.25 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a

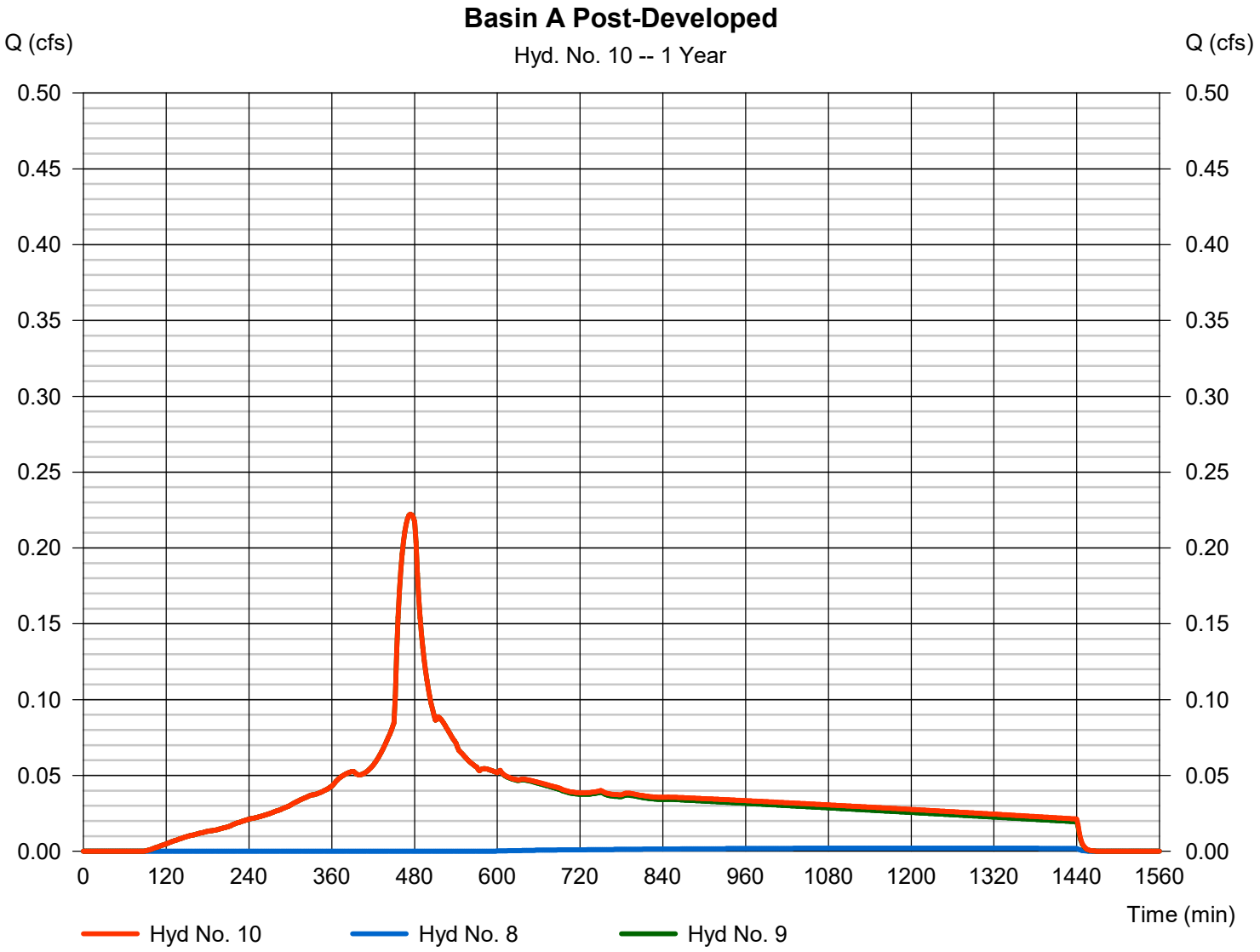


Hydrograph Report

Hyd. No. 10

Basin A Post-Developed

Hydrograph type	=	Combine	Peak discharge	=	0.222 cfs
Storm frequency	=	1 yrs	Time to peak	=	474 min
Time interval	=	2 min	Hyd. volume	=	3,204 cuft
Inflow hyds.	=	8, 9	Contrib. drain. area	=	1.140 ac

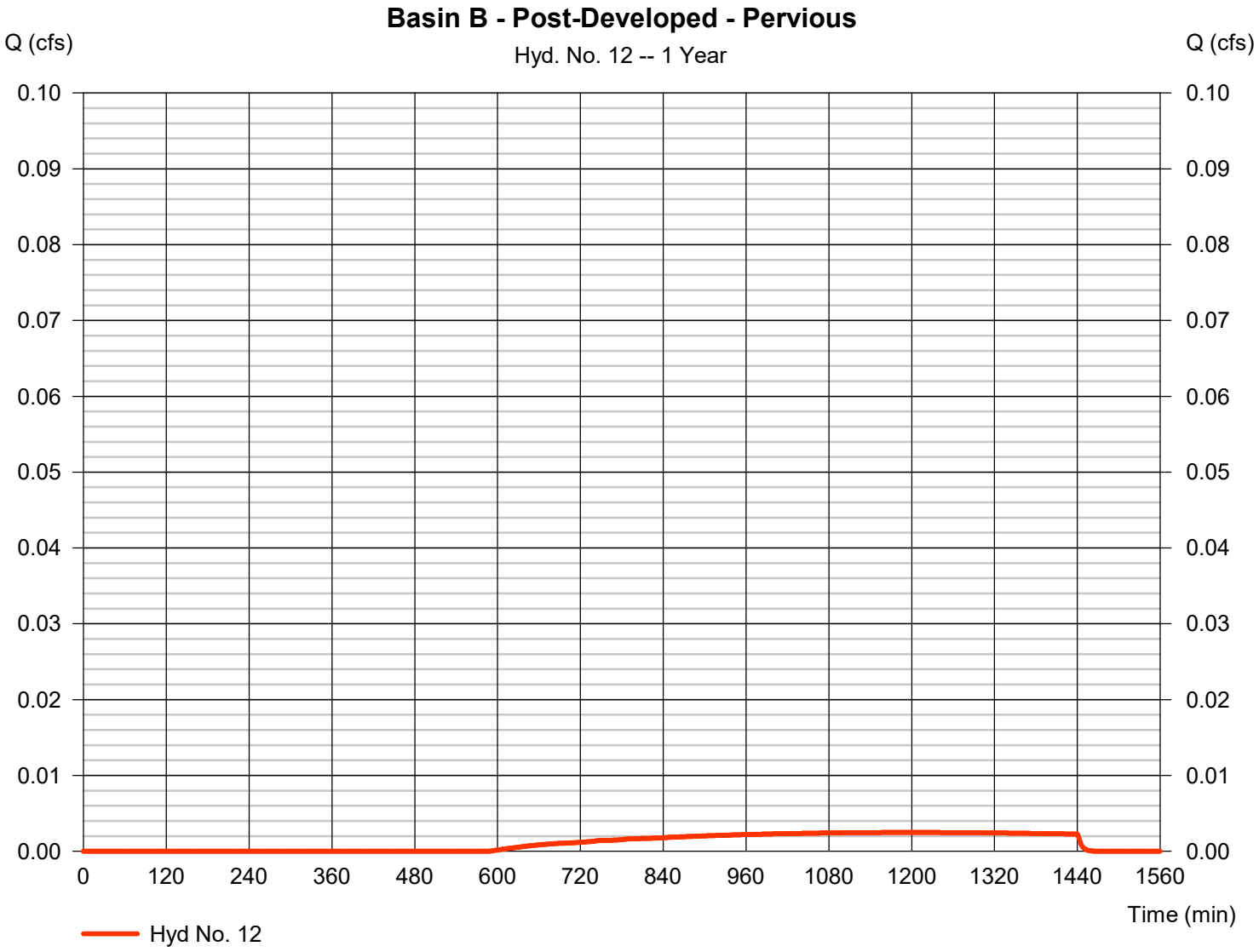


Hydrograph Report

Hyd. No. 12

Basin B - Post-Developed - Pervious

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.002 cfs
Storm frequency	= 1 yrs	Time to peak	= 1196 min
Time interval	= 2 min	Hyd. volume	= 101 cuft
Drainage area	= 0.377 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 1.25 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

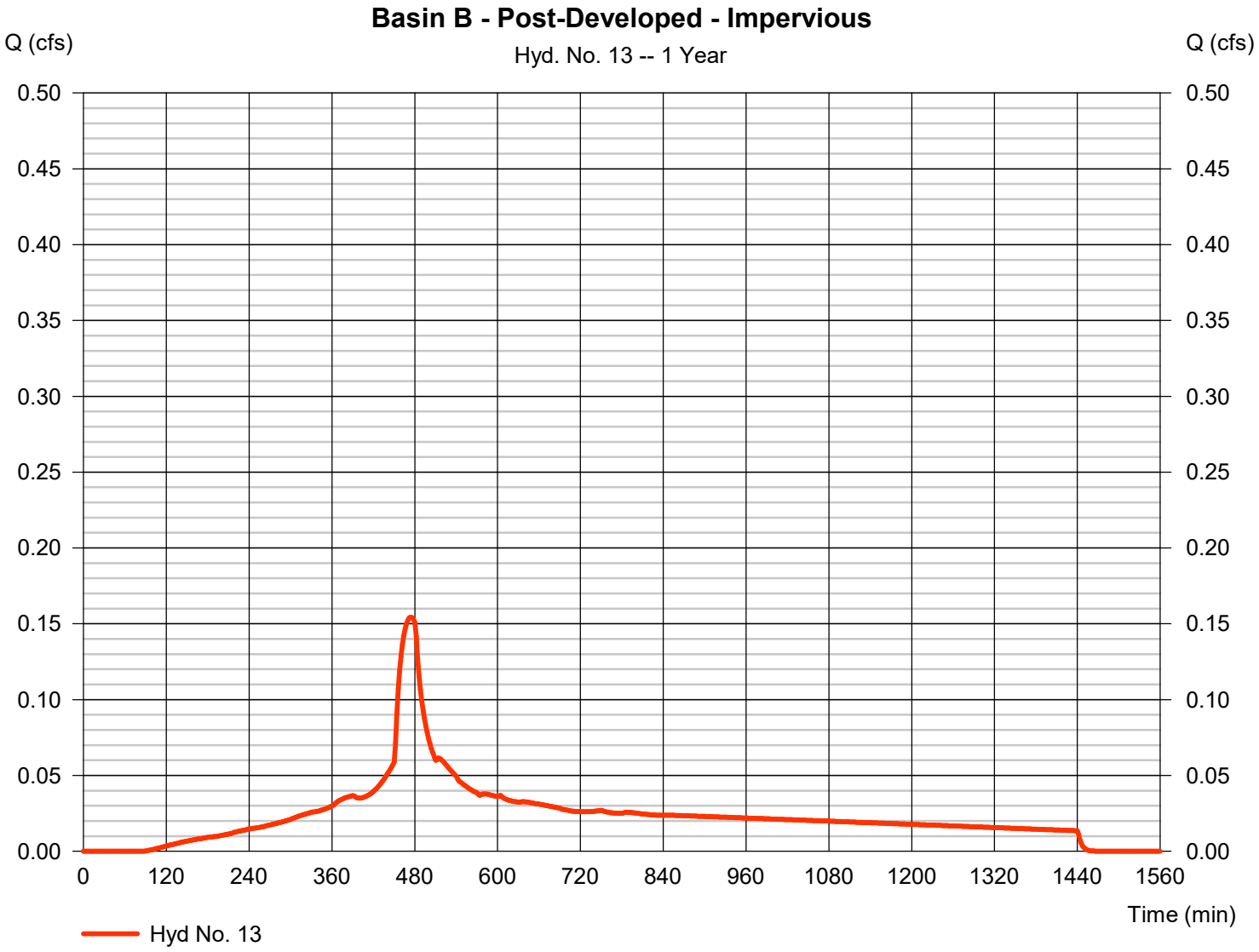


Hydrograph Report

Hyd. No. 13

Basin B - Post-Developed - Impervious

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.154 cfs
Storm frequency	= 1 yrs	Time to peak	= 474 min
Time interval	= 2 min	Hyd. volume	= 2,167 cuft
Drainage area	= 0.577 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 1.25 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

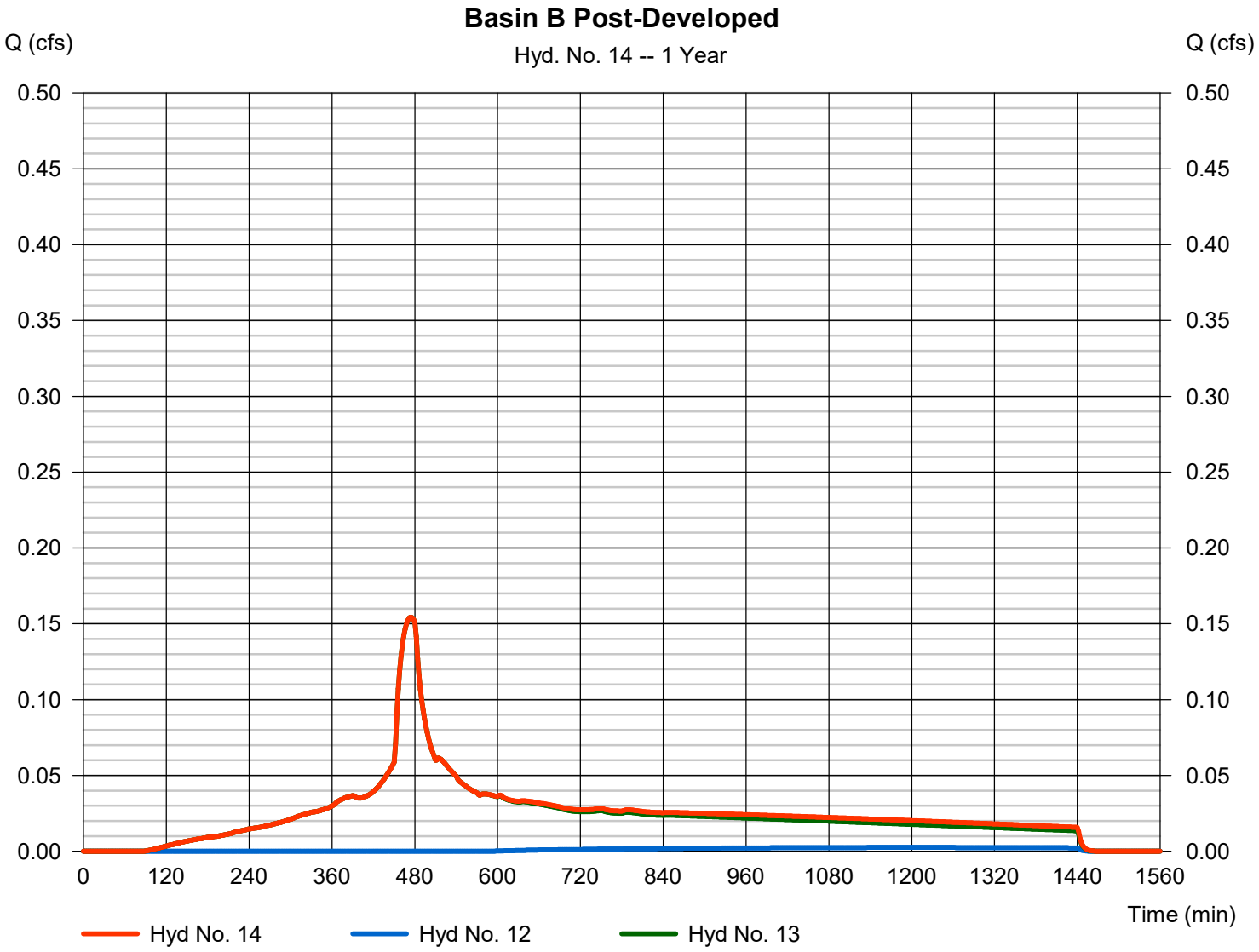


Hydrograph Report

Hyd. No. 14

Basin B Post-Developed

Hydrograph type	=	Combine	Peak discharge	=	0.154 cfs
Storm frequency	=	1 yrs	Time to peak	=	474 min
Time interval	=	2 min	Hyd. volume	=	2,268 cuft
Inflow hyds.	=	12, 13	Contrib. drain. area	=	0.954 ac



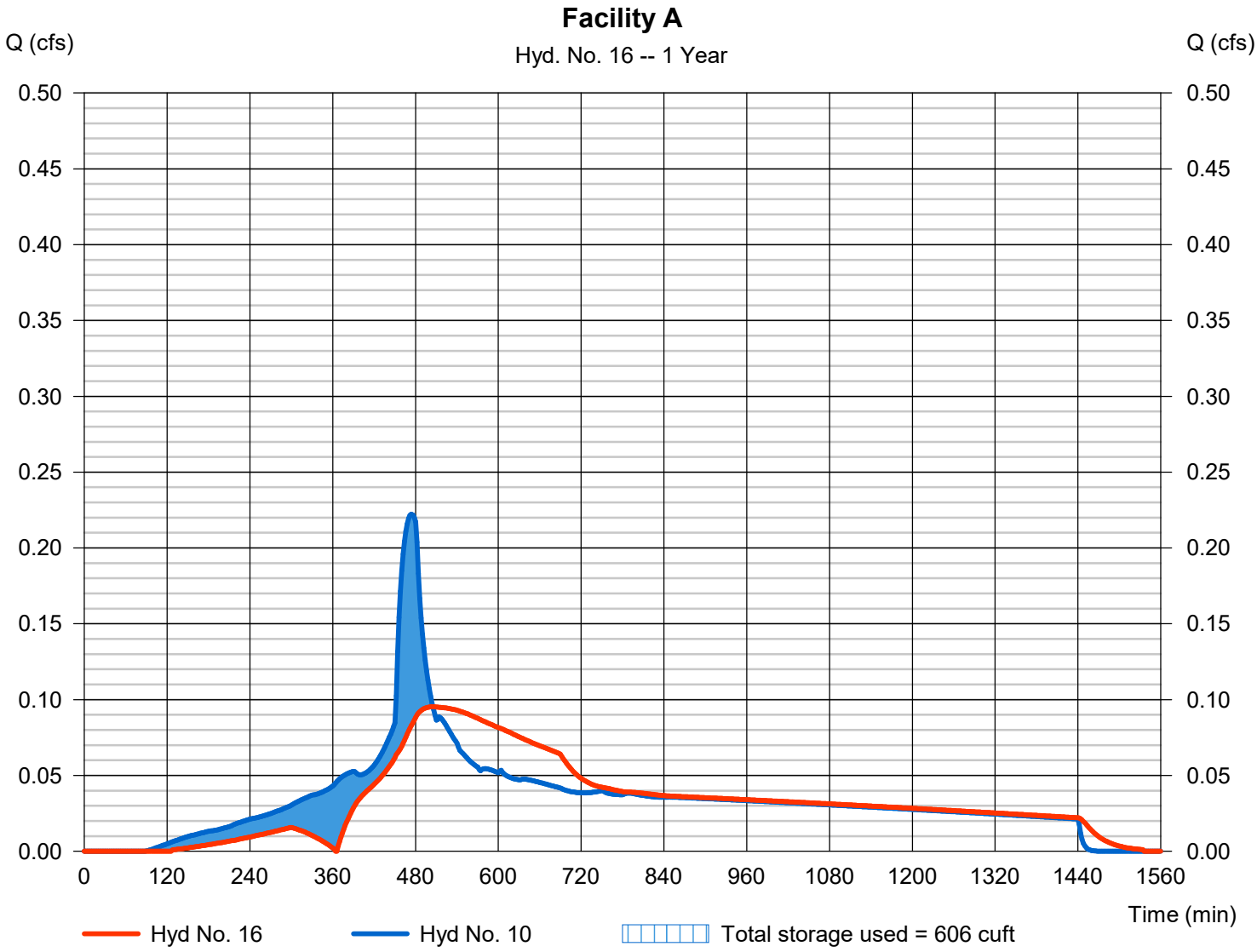
Hydrograph Report

Hyd. No. 16

Facility A

Hydrograph type	=	Reservoir	Peak discharge	=	0.095 cfs
Storm frequency	=	1 yrs	Time to peak	=	506 min
Time interval	=	2 min	Hyd. volume	=	2,979 cuft
Inflow hyd. No.	=	10 - Basin A Post-Developed	Max. Elevation	=	173.54 ft
Reservoir name	=	Extended Dry Basin A	Max. Storage	=	606 cuft

Storage Indication method used.



Pond Report

Pond No. 1 - Extended Dry Basin A

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 173.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	173.00	799	0	0
1.00	174.00	1,464	1,115	1,115
2.00	175.00	2,186	1,813	2,928
3.00	176.00	2,965	2,565	5,493

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 12.00	2.30	5.00	0.00
Span (in)	= 12.00	2.30	5.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 173.00	173.00	174.50	0.00
Length (ft)	= 100.00	0.00	0.00	0.00
Slope (%)	= 1.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	Yes	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 4.71	0.00	0.00	0.00
Crest El. (ft)	= 175.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	173.00	0.00	0.00	0.00	---	0.00	---	---	---	---	---	0.000
1.00	1,115	174.00	0.13 ic	0.13 ic	0.00	---	0.00	---	---	---	---	---	0.127
2.00	2,928	175.00	0.54 ic	0.18 ic	0.35 ic	---	0.00	---	---	---	---	---	0.532
3.00	5,493	176.00	0.97 ic	0.22 ic	0.75 ic	---	15.68	---	---	---	---	---	16.65

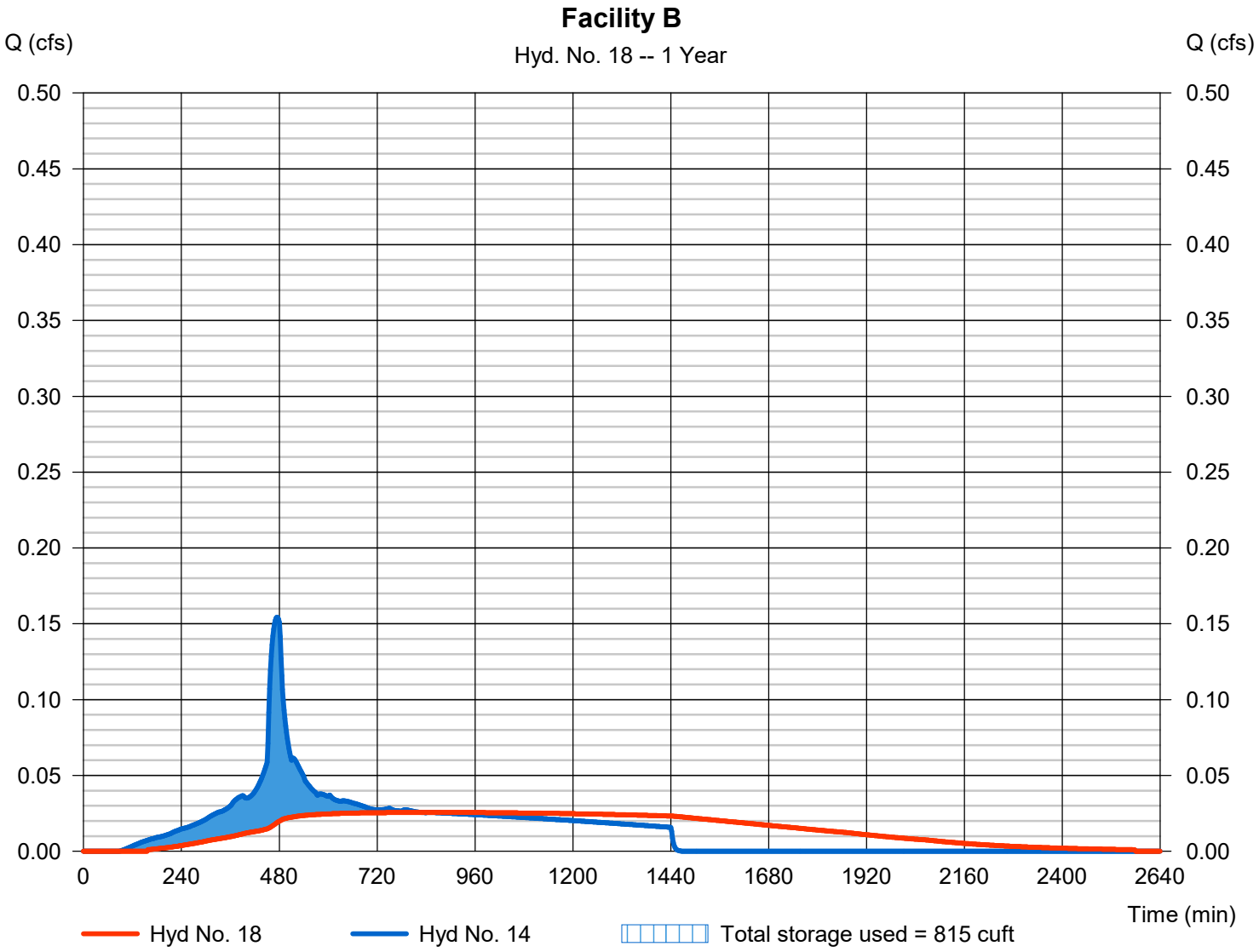
Hydrograph Report

Hyd. No. 18

Facility B

Hydrograph type	=	Reservoir	Peak discharge	=	0.026 cfs
Storm frequency	=	1 yrs	Time to peak	=	830 min
Time interval	=	2 min	Hyd. volume	=	2,253 cuft
Inflow hyd. No.	=	14 - Basin B Post-Developed	Max. Elevation	=	173.22 ft
Reservoir name	=	Extended Dry Basin B	Max. Storage	=	815 cuft

Storage Indication method used.



Pond Report

Pond No. 3 - Extended Dry Basin B

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 172.50 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	172.50	925	0	0
1.00	173.50	1,344	1,128	1,128
2.00	174.50	1,820	1,576	2,704
3.00	175.50	2,352	2,080	4,784

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 12.00	1.10	2.20	0.00
Span (in)	= 12.00	1.10	2.20	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 172.50	172.50	173.50	0.00
Length (ft)	= 50.00	0.00	0.00	0.00
Slope (%)	= 1.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 4.71	0.00	0.00	0.00
Crest El. (ft)	= 174.50	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	172.50	0.00	0.00	0.00	---	0.00	---	---	---	---	---	0.000
1.00	1,128	173.50	0.03 ic	0.03 ic	0.00	---	0.00	---	---	---	---	---	0.030
2.00	2,704	174.50	0.04 ic	0.04 ic	0.12 ic	---	0.00	---	---	---	---	---	0.165
3.00	4,784	175.50	0.06 ic	0.05 ic	0.18 ic	---	15.68	---	---	---	---	---	15.91

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Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

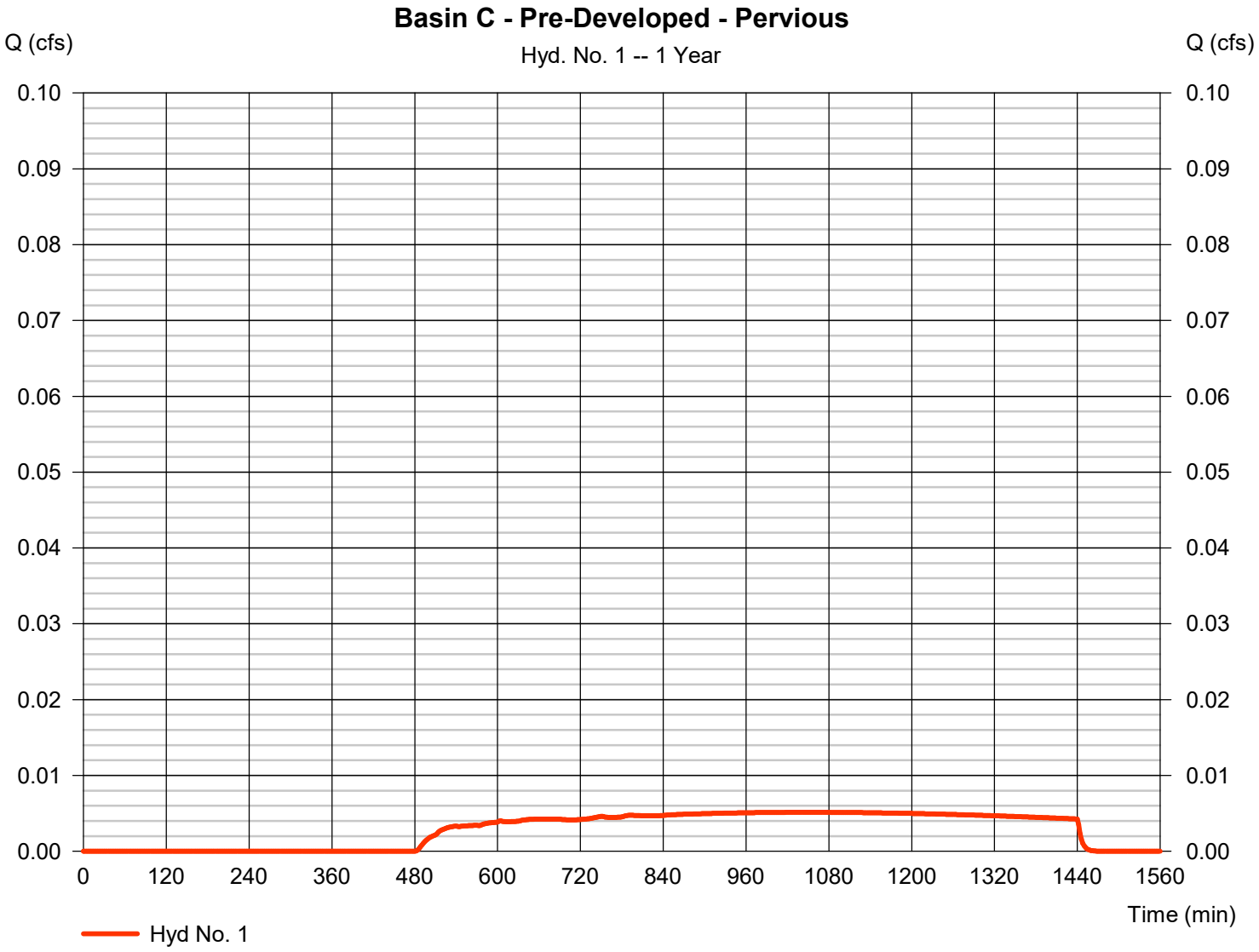
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SBUH Runoff	0.005	2	1050	260	------	------	------	Basin C - Pre-Developed - Pervious
2	SBUH Runoff	0.022	2	474	304	------	------	------	Basin C - Pre-Developed - Impervious
3	Combine	0.022	2	474	564	1, 2	------	------	Basin C Pre-Developed
4	SBUH Runoff	0.001	2	1050	76	------	------	------	Basin D - Pre-Developed - Pervious
5	SBUH Runoff	0.016	2	474	229	------	------	------	Basin D - Pre-Developed - Impervious
6	Combine	0.016	2	474	305	4, 5	------	------	Basin D Pre-Developed
8	SBUH Runoff	0.002	2	1196	85	------	------	------	Basin C - Post-Developed - Pervious
9	SBUH Runoff	0.062	2	474	875	------	------	------	Basin C - Post-Developed - Imperviou
10	Combine	0.062	2	474	960	8, 9	------	------	Basin C Post-Developed
12	SBUH Runoff	0.000	2	1196	14	------	------	------	Basin D - Post-Developed - Pervious
13	SBUH Runoff	0.039	2	474	552	------	------	------	Basin D - Post-Developed - Imperviou
14	Combine	0.039	2	474	566	12, 13	------	------	Basin D Post-Developed

Hydrograph Report

Hyd. No. 1

Basin C - Pre-Developed - Pervious

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.005 cfs
Storm frequency	= 1 yrs	Time to peak	= 1050 min
Time interval	= 2 min	Hyd. volume	= 260 cuft
Drainage area	= 0.469 ac	Curve number	= 79
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 1.25 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

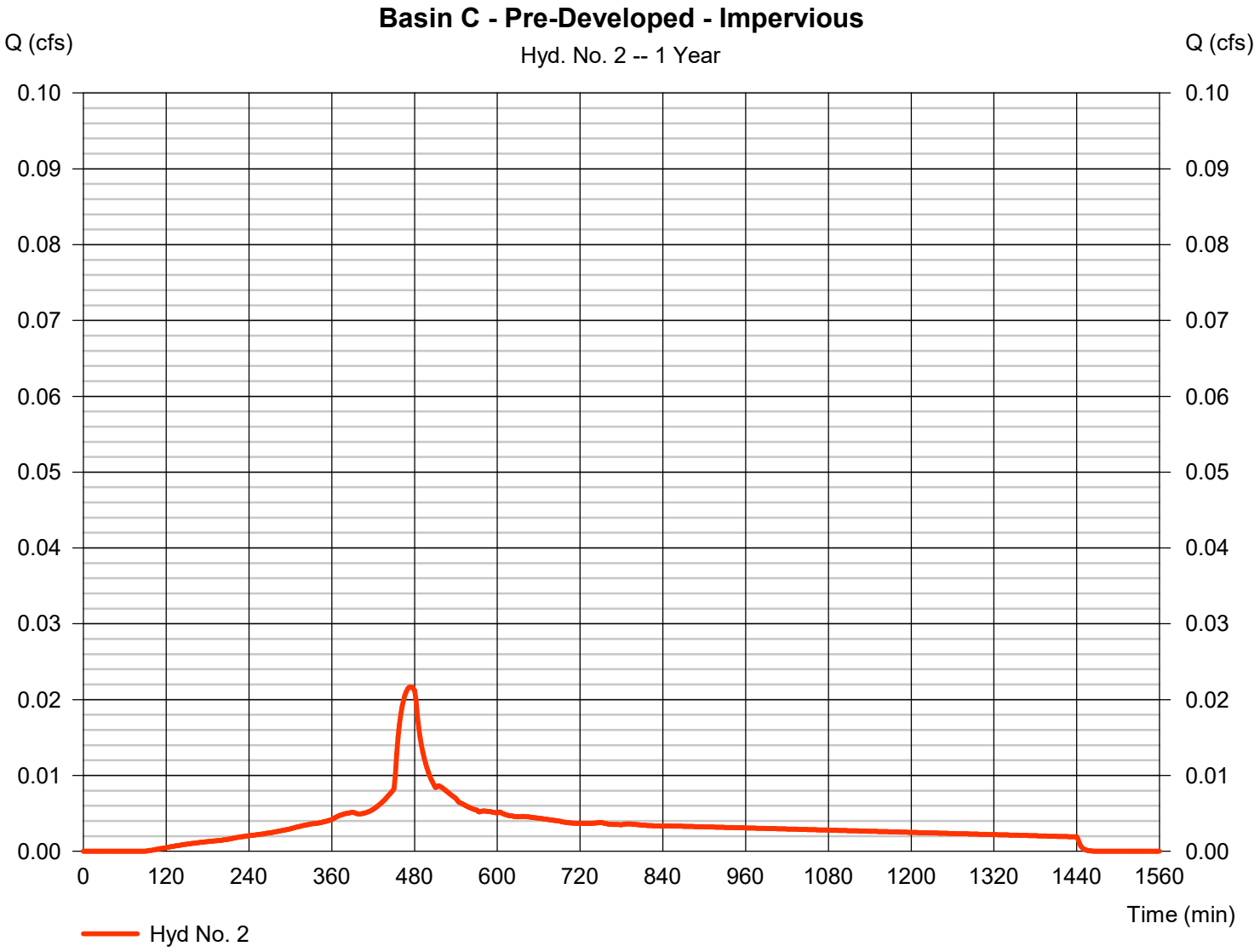


Hydrograph Report

Hyd. No. 2

Basin C - Pre-Developed - Impervious

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.022 cfs
Storm frequency	= 1 yrs	Time to peak	= 474 min
Time interval	= 2 min	Hyd. volume	= 304 cuft
Drainage area	= 0.081 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 1.25 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

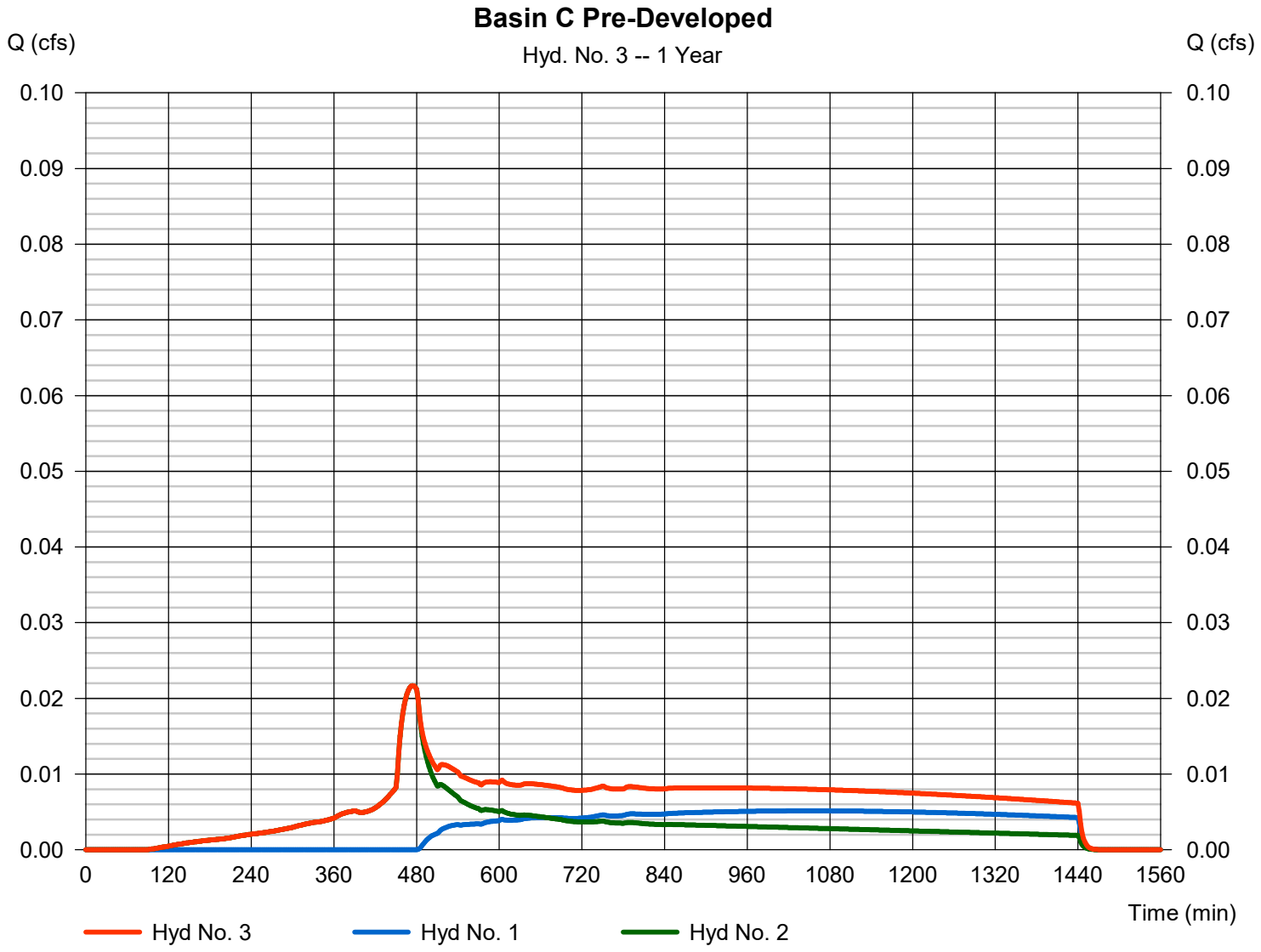


Hydrograph Report

Hyd. No. 3

Basin C Pre-Developed

Hydrograph type	=	Combine	Peak discharge	=	0.022 cfs
Storm frequency	=	1 yrs	Time to peak	=	474 min
Time interval	=	2 min	Hyd. volume	=	564 cuft
Inflow hyds.	=	1, 2	Contrib. drain. area	=	0.550 ac

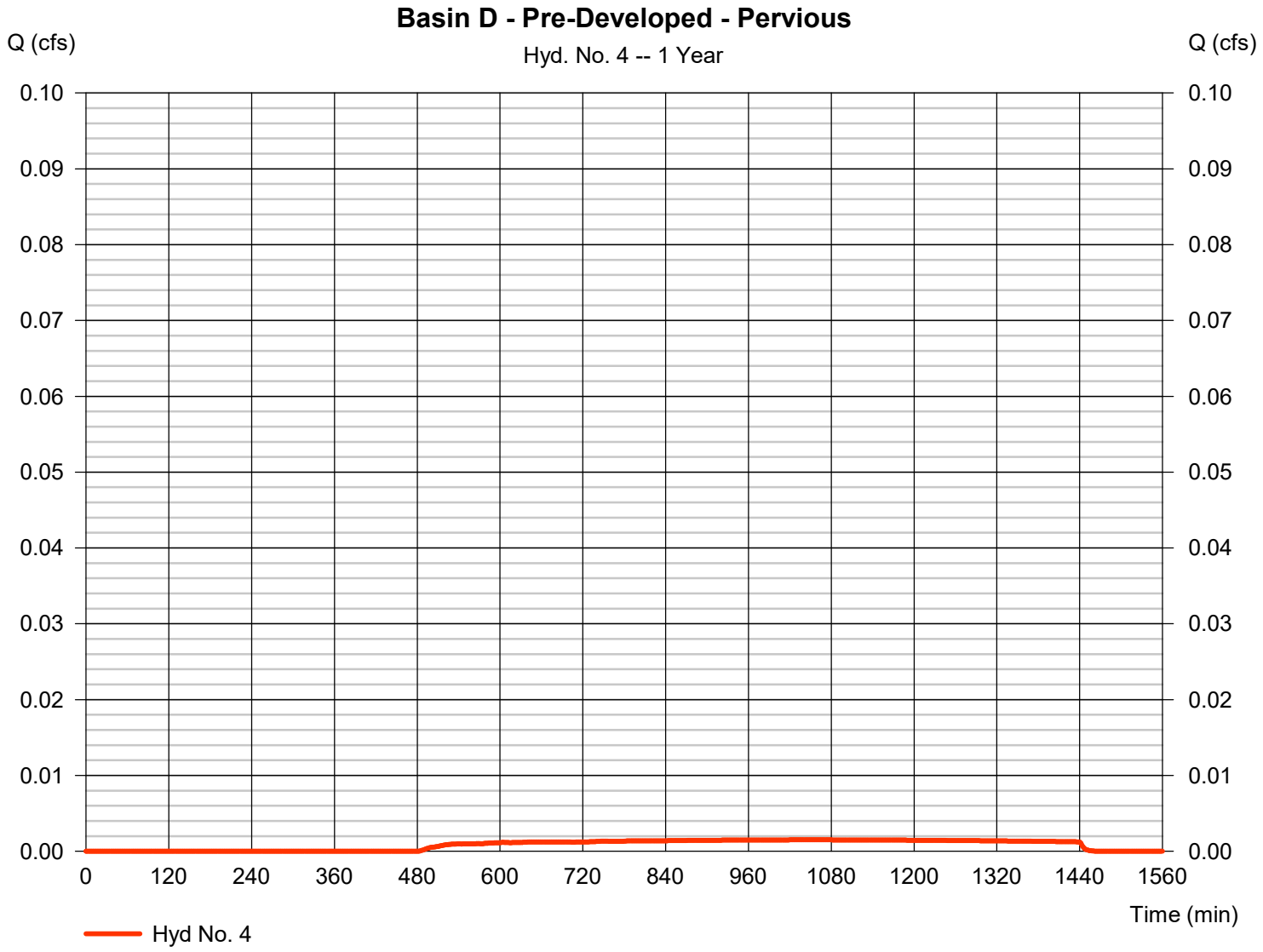


Hydrograph Report

Hyd. No. 4

Basin D - Pre-Developed - Pervious

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.001 cfs
Storm frequency	= 1 yrs	Time to peak	= 1050 min
Time interval	= 2 min	Hyd. volume	= 76 cuft
Drainage area	= 0.137 ac	Curve number	= 79
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 1.25 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

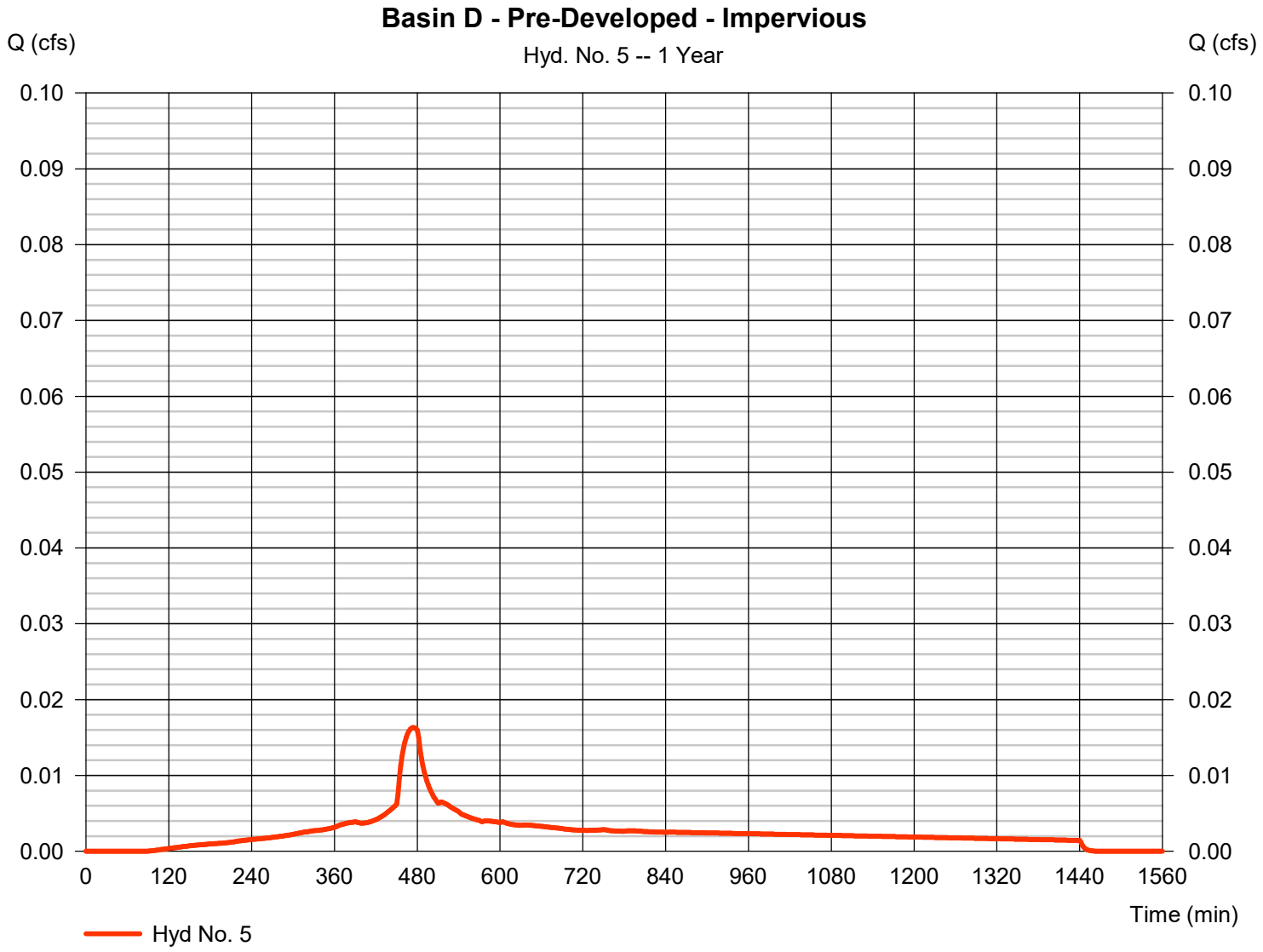


Hydrograph Report

Hyd. No. 5

Basin D - Pre-Developed - Impervious

Hydrograph type	=	SBUH Runoff	Peak discharge	=	0.016 cfs
Storm frequency	=	1 yrs	Time to peak	=	474 min
Time interval	=	2 min	Hyd. volume	=	229 cuft
Drainage area	=	0.061 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	1.25 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a

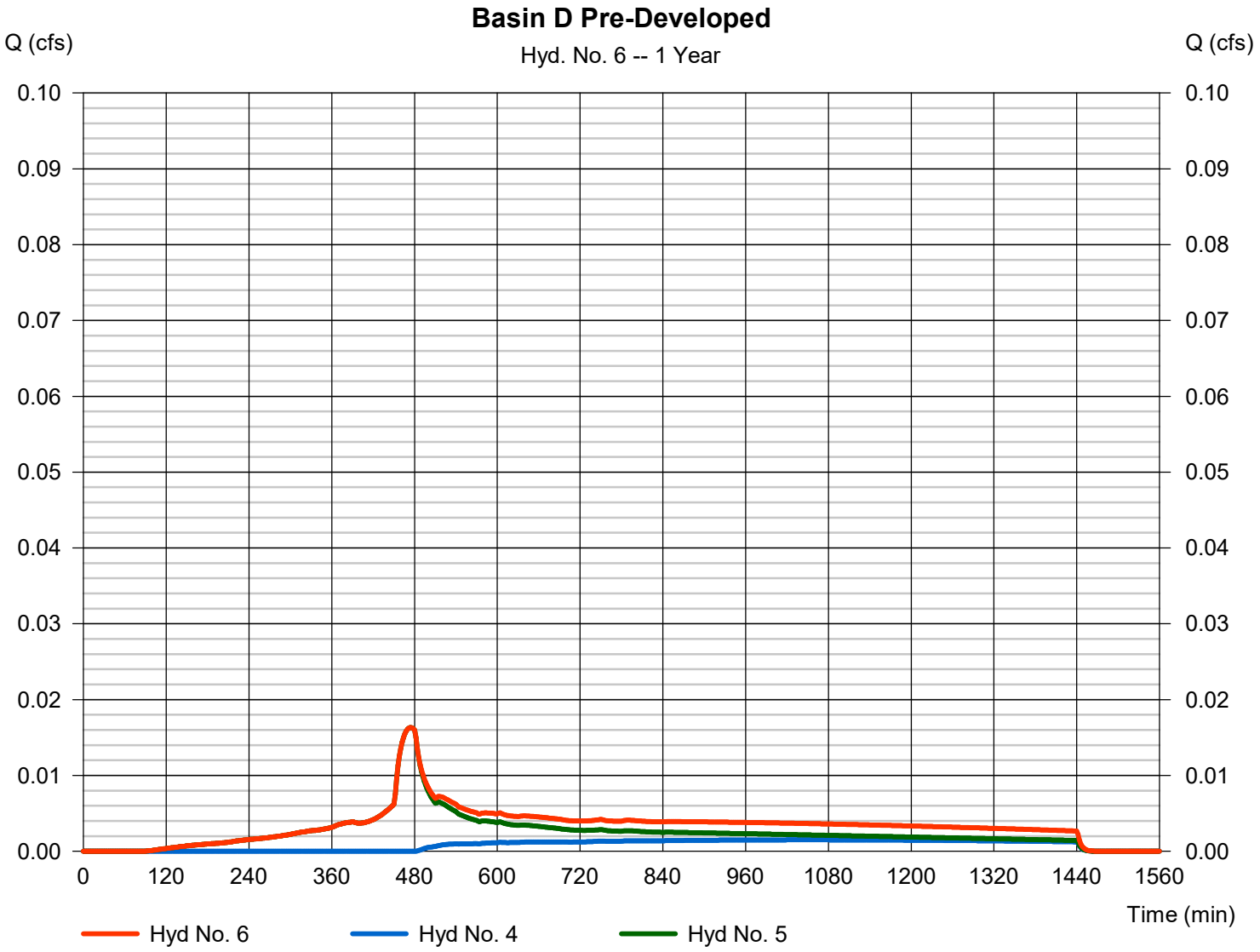


Hydrograph Report

Hyd. No. 6

Basin D Pre-Developed

Hydrograph type	= Combine	Peak discharge	= 0.016 cfs
Storm frequency	= 1 yrs	Time to peak	= 474 min
Time interval	= 2 min	Hyd. volume	= 305 cuft
Inflow hyds.	= 4, 5	Contrib. drain. area	= 0.198 ac

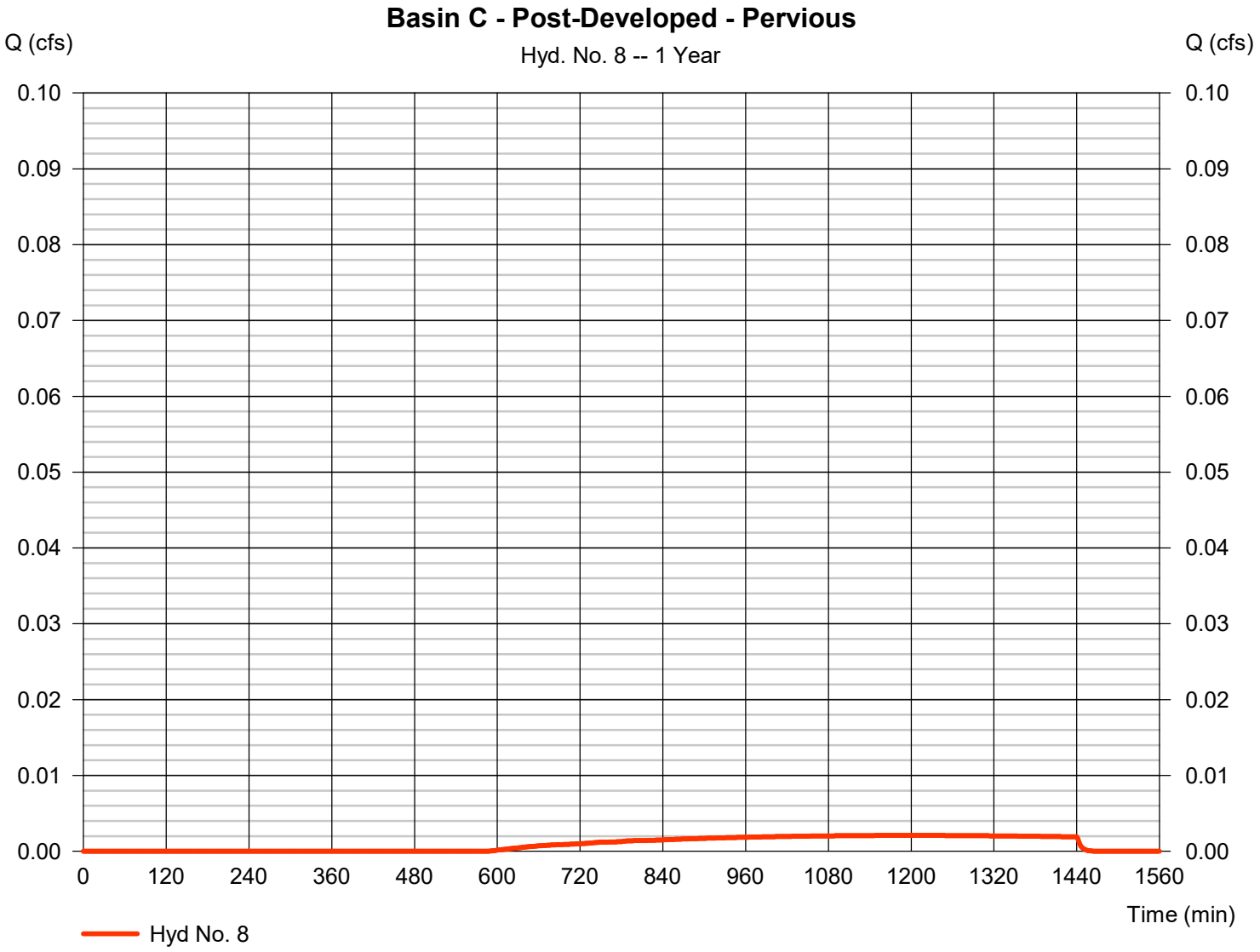


Hydrograph Report

Hyd. No. 8

Basin C - Post-Developed - Pervious

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.002 cfs
Storm frequency	= 1 yrs	Time to peak	= 1196 min
Time interval	= 2 min	Hyd. volume	= 85 cuft
Drainage area	= 0.317 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 1.25 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

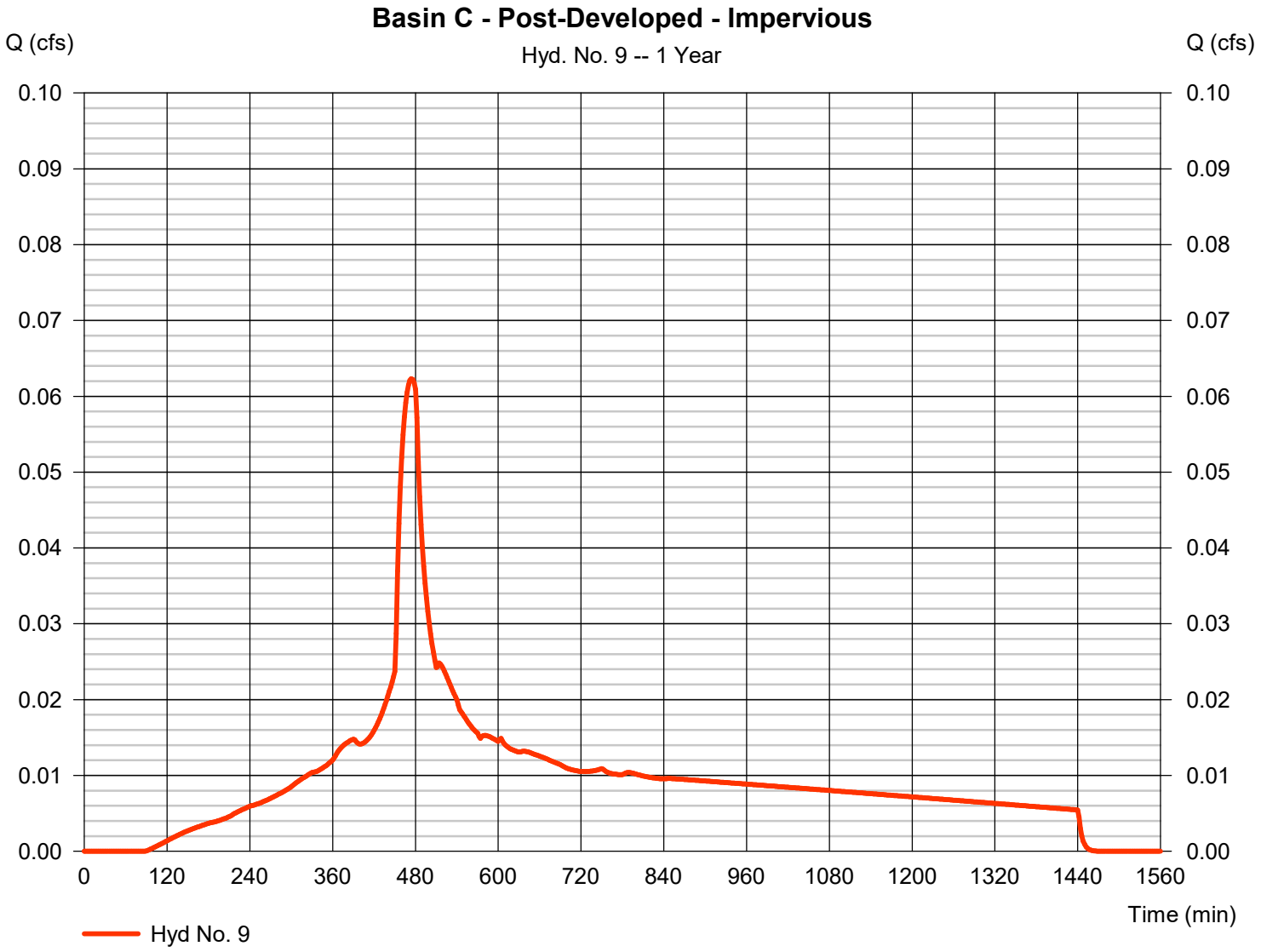


Hydrograph Report

Hyd. No. 9

Basin C - Post-Developed - Impervious

Hydrograph type	=	SBUH Runoff	Peak discharge	=	0.062 cfs
Storm frequency	=	1 yrs	Time to peak	=	474 min
Time interval	=	2 min	Hyd. volume	=	875 cuft
Drainage area	=	0.233 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	1.25 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a

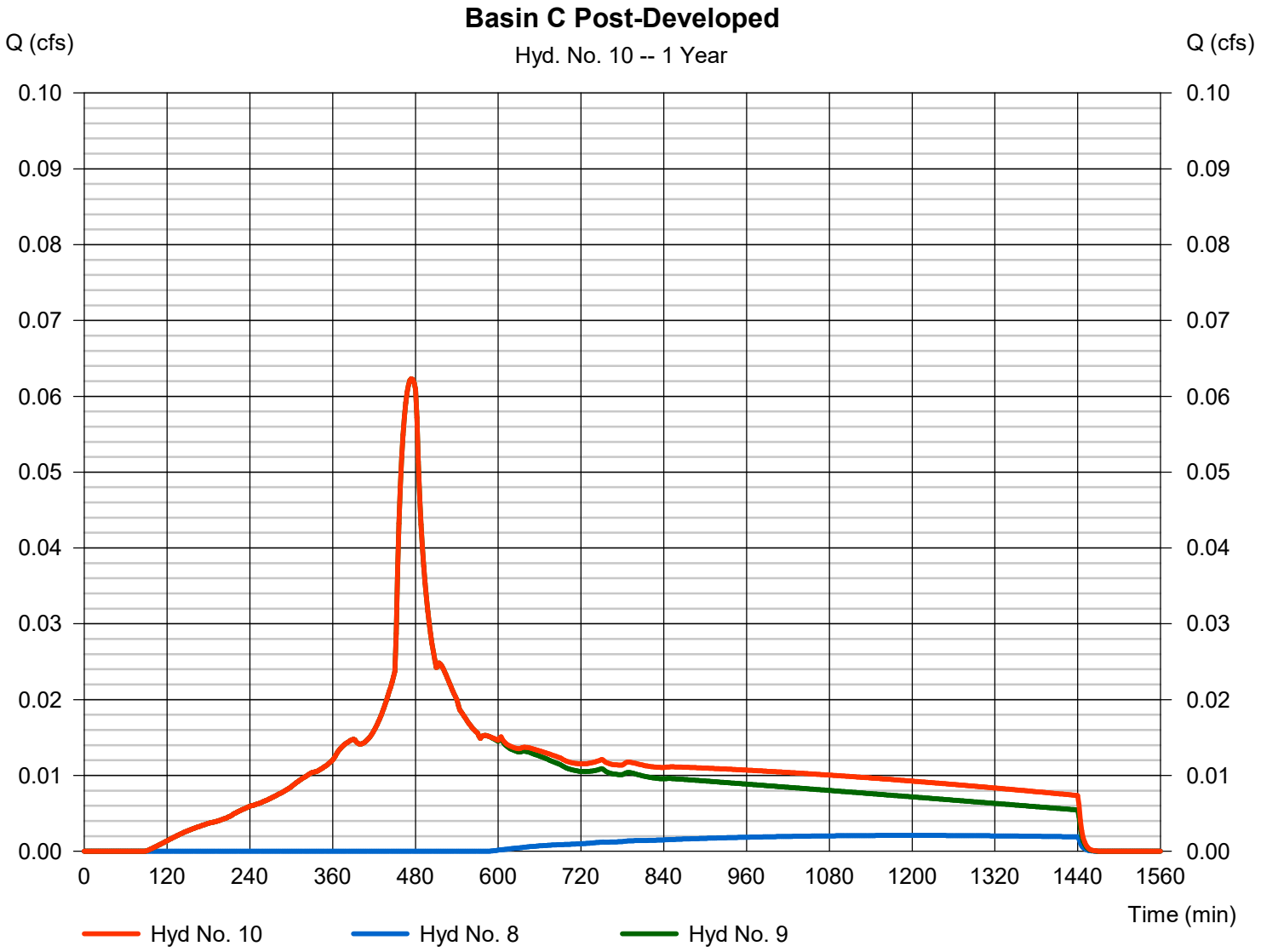


Hydrograph Report

Hyd. No. 10

Basin C Post-Developed

Hydrograph type	=	Combine	Peak discharge	=	0.062 cfs
Storm frequency	=	1 yrs	Time to peak	=	474 min
Time interval	=	2 min	Hyd. volume	=	960 cuft
Inflow hyds.	=	8, 9	Contrib. drain. area	=	0.550 ac

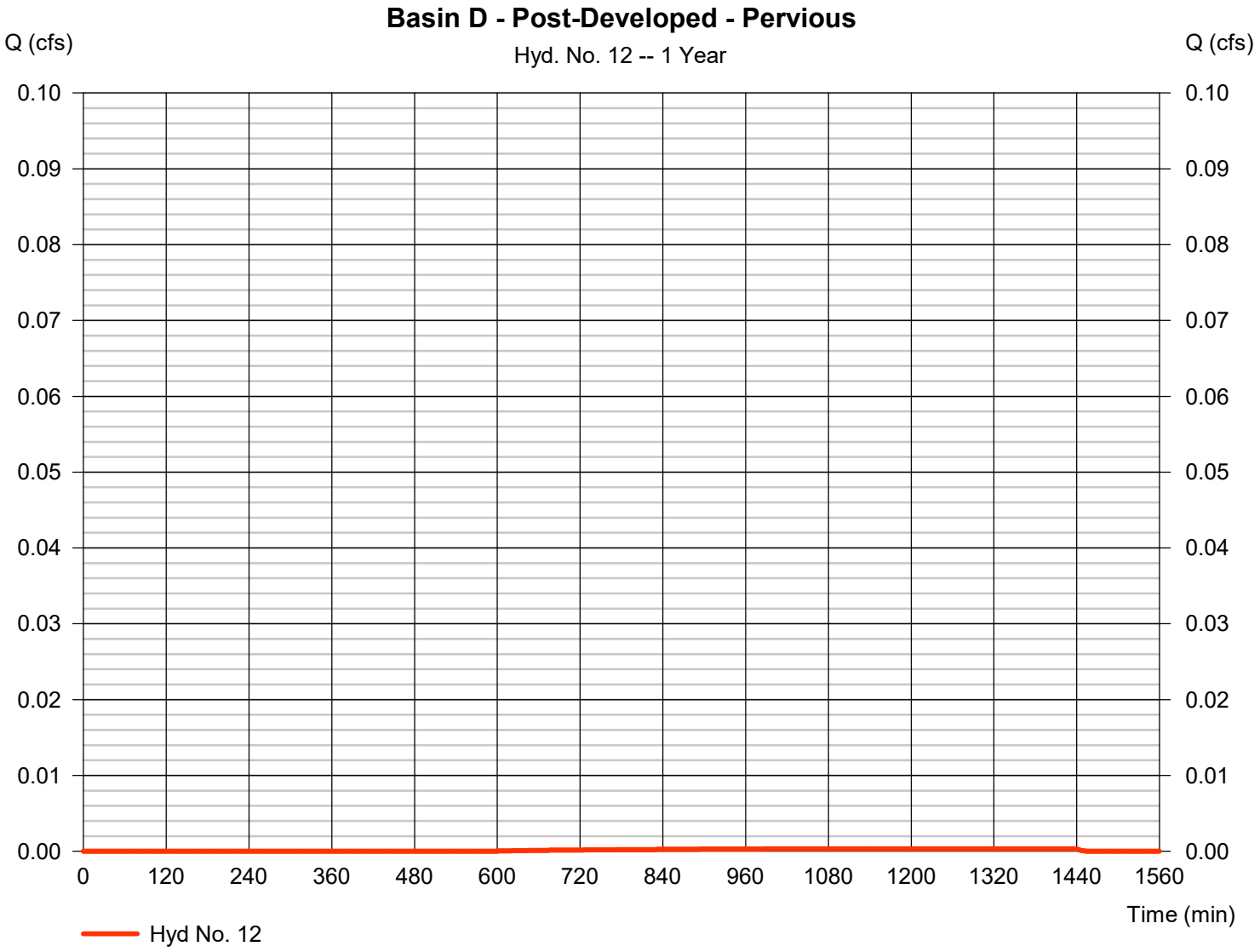


Hydrograph Report

Hyd. No. 12

Basin D - Post-Developed - Pervious

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.000 cfs
Storm frequency	= 1 yrs	Time to peak	= 1196 min
Time interval	= 2 min	Hyd. volume	= 14 cuft
Drainage area	= 0.052 ac	Curve number	= 74
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 1.25 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

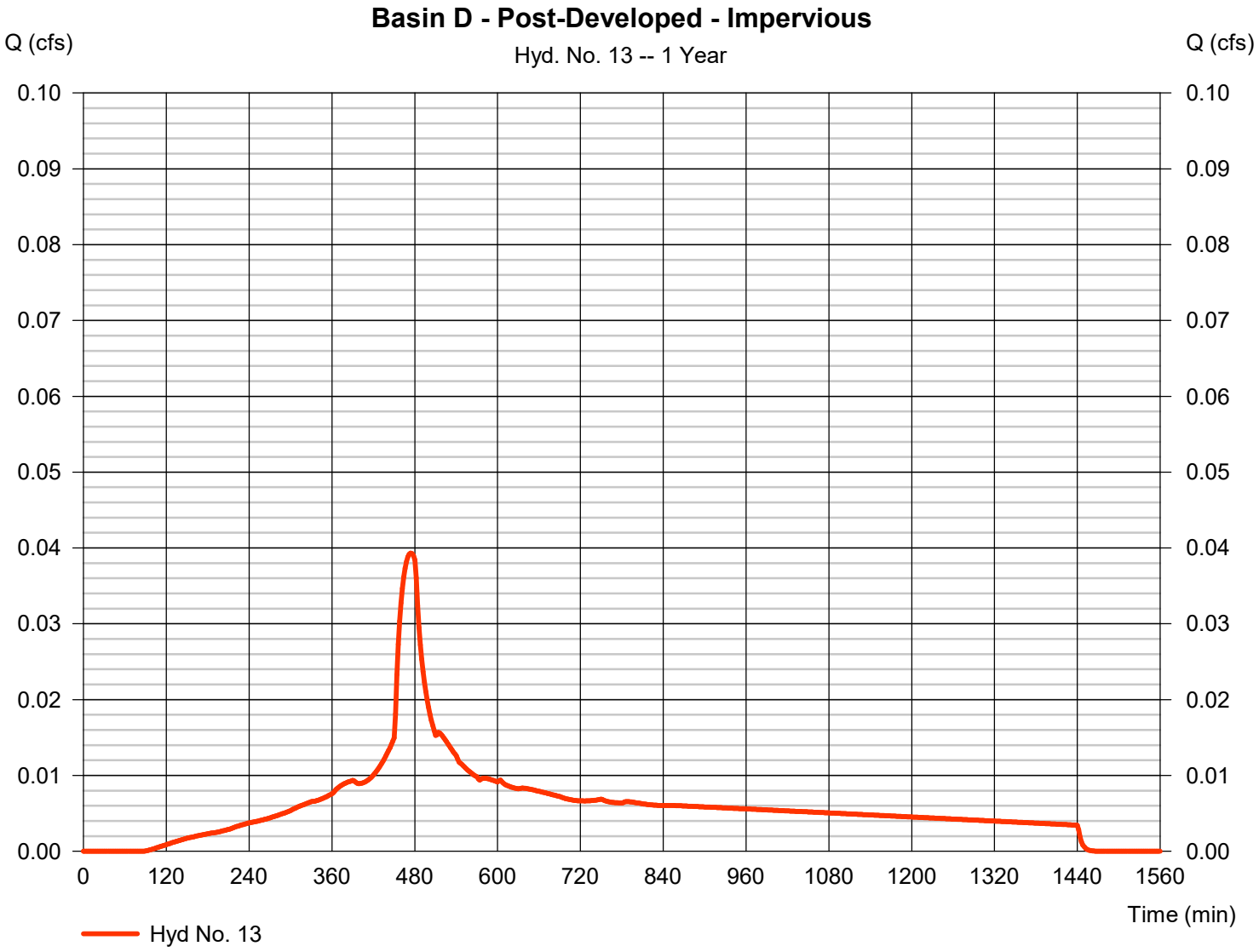


Hydrograph Report

Hyd. No. 13

Basin D - Post-Developed - Impervious

Hydrograph type	=	SBUH Runoff	Peak discharge	=	0.039 cfs
Storm frequency	=	1 yrs	Time to peak	=	474 min
Time interval	=	2 min	Hyd. volume	=	552 cuft
Drainage area	=	0.147 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	1.25 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a

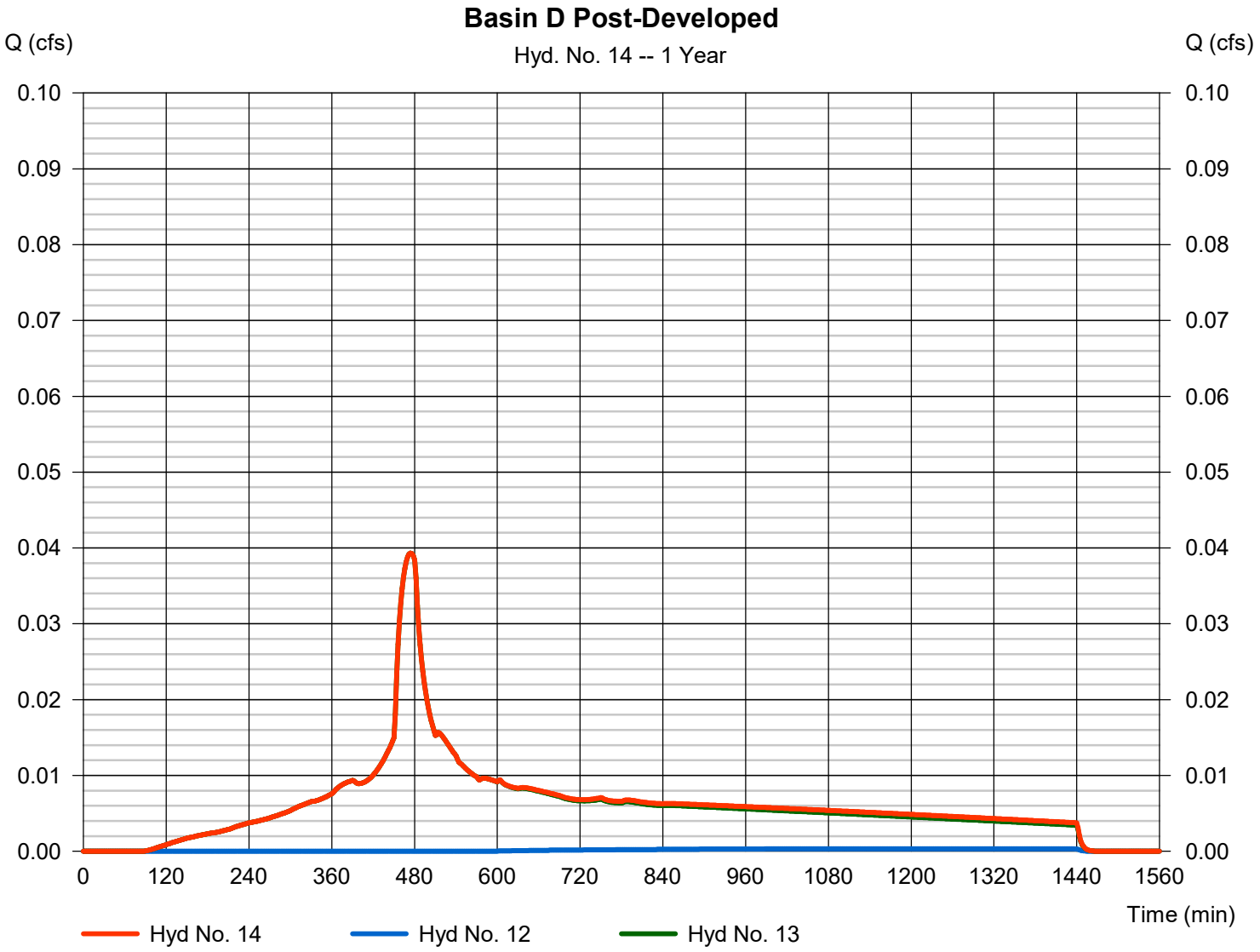


Hydrograph Report

Hyd. No. 14

Basin D Post-Developed

Hydrograph type	=	Combine	Peak discharge	=	0.039 cfs
Storm frequency	=	1 yrs	Time to peak	=	474 min
Time interval	=	2 min	Hyd. volume	=	566 cuft
Inflow hyds.	=	12, 13	Contrib. drain. area	=	0.199 ac



APPENDIX F:

GEOTECHNICAL REPORT

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Chick-fil-A Restaurant #05889

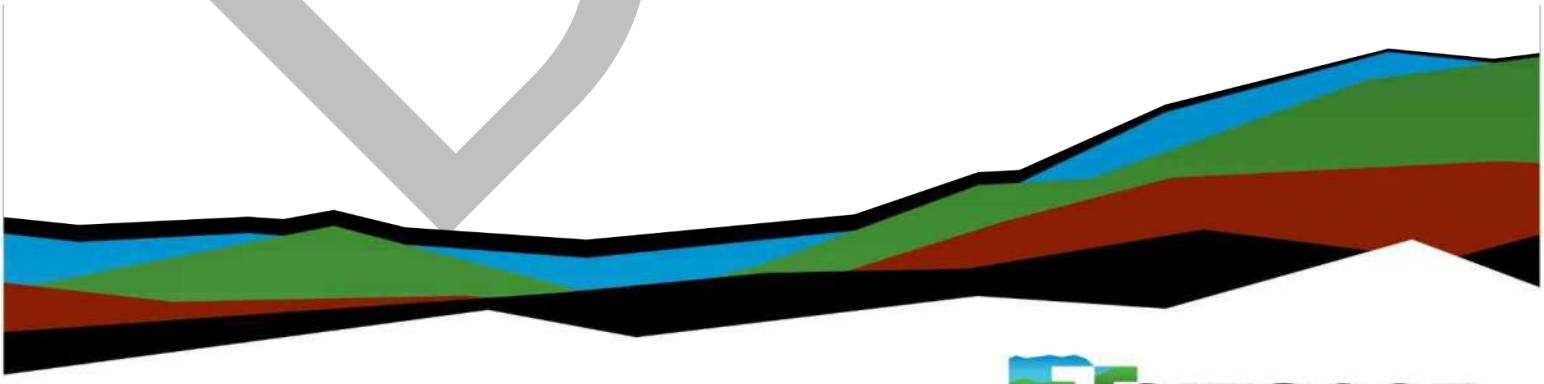
Geotechnical Engineering Report

July 19, 2024 | Terracon Project No. 82245055

Prepared for:

Chick-fil-A, Inc.
5200 Buffington Road
Atlanta, Georgia 30349

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July 19, 2024

Chick-fil-A, Inc.
5200 Buffington Road
Atlanta, Georgia 30349

Attn: Ms. Jessika Guerrero
P: 562-441-3631
E: jessika.guerrero@cfacorp.com

Re: Geotechnical Engineering Report
Chick-fil-A Restaurant #05889
W Baseline St & N 4th Avenue
Cornelius, OR
Terracon Project No. 82245055

Dear Ms. Jessika Guerrero:

We have completed the scope of Geotechnical Engineering services for the referenced project in general accordance with Terracon's Task Order dated June 4, 2024, and PO 1740068. This report presents the findings of subsurface exploration and provides geotechnical recommendations concerning earthwork and the design and construction of foundations, floor slabs, and pavements for the proposed project.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report or if we may be of further service, please contact us.

Sincerely,
Terracon Consultant, Inc.

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Peyman Chaichi, P.E.
Project Engineer

Brice W. Plouse, P.E.
Geotechnical Department Manager

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Site Location and Exploration Plans
Exploration and Laboratory Results
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Note: This report was originally delivered in a web-based format. **Blue Bold** text in the report indicates a referenced section heading. The PDF version also includes hyperlinks which direct the reader to that section and clicking on the Terracon logo will bring you back to this page. For more interactive features, please view your project online at **client.terracon.com**.

Refer to each individual Attachment for a listing of contents.

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Report Summary

Topic [1]	Overview Statement [2]
Project Description	The proposed project will consist of an approximately 5,586-square-foot, single-story structure with about 100 pavement parking stalls and drive-through lanes with a canopy within the 2.33-acre site.
Geotechnical Characterization	Subsurface conditions encountered at the site consist of: ■ Topsoil and existing fill up to 1.5 feet below the existing grade was encountered. ■ Underlying the topsoil or fill consists of silt with a different amount of sand to the maximum depth of the borings. ■ interpret the soil beneath the maximum depth explored by the borings to be lean clay (Hillsboro Formation). ■ Groundwater was encountered as shallow as 3.7 feet below the ground surface (bgs) on the northwest side of the site and 7.0 feet bgs on the east side of the site. ■ Based on the seismic velocity test at the CPT locations, the weighted average of shear wave velocity was 804 ft/s for the top 100 feet bgs.
Earthwork	Site soils contain significant fines and are moist to wet making them difficult to reuse as structural fill. These soils should be planned to be removed from the site or could be considered for reuse during the summer dry months if they meet the requirements defined in the **Fill Material Types** section.
Shallow Foundations	Shallow foundations should bear on a minimum of 24-inches of Select Fill underlain by undisturbed, native soils to provide building support. We recommend an allowable bearing pressure of 2,000 psf. Over-excavations should extend beyond the foundation edges laterally a minimum of 8 inches per foot of over-excavation. We expect settlements of foundations to be less than 1 inch in total and a 2/3-inch differential over 50 feet.
Pavements	Loads and traffic volume were not provided. With subgrade prepared as noted in **Earthwork**. Pavement Design for flexible pavements (AC): ■ 4 inches of AC over 12 to 14 inches aggregate base course over fabric. Pavement Design for rigid pavements (PCC): ■ 5 to 7 inches PCC over 6 inches of aggregate base course over fabric.

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Topic [1]	Overview Statement [2]
Seismic Consideration	The site soil has a risk of liquefaction. ASCE 7-16 Section 20.3.1 and ASCE 7-22 Section 20.2.1 indicate that the presence of liquefiable soils underlying the site necessitates a Site Class of F. Based on our analysis, we estimate a total settlement of 6.4 inches and a differential settlement of 2/3 of the total. Based on ASCE 7-16 requirements to prevent collapse, the building could be supported on shallow foundations. Lateral spreading is no concern at this site due to the significant distance to a free face.
General Comments	This section contains important information about the limitations of this geotechnical engineering report.

1. If the reader is reviewing this report as a pdf, the topics above can be used to access the appropriate section of the report by simply clicking on the topic itself.
2. This summary is for convenience only. It should be used in conjunction with the entire report for design purposes.

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Introduction

This report presents the results of our subsurface exploration and Geotechnical Engineering services performed for the proposed Chick-fil-A restaurant #05889 to be located at W Baseline St & N 4th Avenue in Cornelius, OR. The purpose of these services was to provide information and geotechnical engineering recommendations relative to:

- Subsurface soil conditions
- Groundwater conditions
- Seismic site classification per ASCE 7-16 & ASCE 7-22
- Liquefaction and lateral spread potential
- Site preparation and earthwork
- Demolition considerations
- Foundation design and construction
- Deep foundation analysis and recommendation
- Floor slab design and construction
- Pavement design and construction
- Infiltration test results

The geotechnical engineering Scope of Services for this project included the advancement of soil borings, laboratory testing, engineering analysis, and preparation of this report.

Drawings showing the site and boring locations are shown on the **Site Location** and **Exploration Plan**, respectively. The results of the laboratory testing performed on soil samples obtained from the site during our field exploration are included on the boring logs and/or as separate graphs in the **Exploration and Laboratory Results** section.

Project Description

Our initial understanding of the project was provided in our proposal, and our current understanding of the project conditions is as follows:

Item	Description
Information Provided	Information provided by email: ■ Conceptual Site Plan by Ware Malcomb dated 1/04/2024 ■ ASTM E 1527-13 User Questionnaire

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Item	Description
Project Description	The proposed project will consist of an approximate 5,586-square-foot, single-story structure with about 100 pavement parking stalls and drive-through lanes with a canopy within the 2.33-acre site.
Building Construction	Wood or light gauge steel-framed with slab-on-grade floor.
Finished Floor Elevation	Not provided. Assumed to be within 2 feet of the existing site grades.
Maximum Loads	Not provided. The following are assumed based on similar projects: ▪ Columns: 50 kips ▪ Walls: 2 kips per linear foot (klf) ▪ Slabs: 100 pounds per square foot (psf)
Grading/Slopes	The site will be developed near existing site grades.
Below-Grade Structures	None.
Pavements	It is assumed, based on similar projects that the project will include asphalt and concrete paved driveway and parking. Assumed traffic is as follows: ▪ Autos/light trucks: 300 vehicles per day ▪ Heavy delivery and trash collection vehicles: 5 vehicles per week ▪ 80,000 lbf fire truck loading ▪ The pavement design period is 20 years.
Building Code	2022 Oregon Structural Specialty Code (2022 OSSC). In May 2024 the State of Oregon issued an alternate method to allow for the use to allow the Multi-Period Response Spectrum (MPRS) of ASCE 7-22 for determination of design ground motion values (Statewide Alternate Method No. 24-03). The alternate method requires use of the updated Site Class designations found in Chapter 20 of ASCE 7-22.

Terracon should be notified if any of the above information is inconsistent with the planned construction, especially the grading limits, as modifications to our recommendations may be necessary.

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Site Conditions

The following description of site conditions is derived from our site visit in association with the field exploration and our review of publicly available geologic and topographic maps.

Item	Description
Parcel Information	The site consists of five parcels with tax lot numbers 2400, 2500, 2600, 2700, and 3000 with a total size of approximately 2.33 acres. The approximate center of the site is located at the following coordinates: ▪ Latitude: 45.5205° N ▪ Longitude: 123.0676° W See **Site Location**
Existing Improvements	Existing houses, asphalt and gravel parking areas, and landscaping.
Current Ground Cover	Building, grass, or asphalt and gravel pavement.
Existing Topography	Relatively flat with elevations varying from 179 feet to 183 feet above mean sea level with less than 0.5 percent slope from north to south and west to east.

We also collected photographs at the time of our field exploration program. Representative photos are provided in our **Photography Log**.

Seismic Considerations

Site Class

Seismic design requirements for structures are based on the Seismic Design Category. Site Class is required to determine the Seismic Design Category for a structure. The 2022 OSSC references ASCE 7-16 for determination of Site Class and seismic design parameters. ASCE 7-16 Site Class is based on the upper 100 feet of the site profile defined by a weighted average value of shear wave velocity in accordance with Section 20.4 of ASCE 7-16.

In May 2024 the State of Oregon issued Statewide Alternate Method No. 24-03, which allows the use of the Multi-Period Response Spectrum (MPRS) of ASCE 7-22 for determination of design ground motion values. The amendment requires the use of the

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updated Site Class designations found in Chapter 20 of ASCE 7-22, which are based on shear wave velocities within the upper 100 feet of the subsurface materials at the site. Shear wave velocities were measured in our CPT borings at the site to determine the Site Class in accordance with Section 20.3 of ASCE 7-22 and Section 20.4 of ASCE 7-16. We have provided site class parameters for each code in the event ASCE 7-22 is adopted before the project is permitted.

As discussed below, the site soils have a high to moderate risk of liquefaction. ASCE 7-16 Section 20.3.1 and ASCE 7-22 Section 20.2.1 indicate the presence of liquefiable soils underlying the site necessitates a **Site Class of F**.

Seismic Design Parameters

The following seismic design parameters may be used for design of the proposed structures:

Description	ASCE 7-16	ASCE 7-22
2022 Oregon Structural Specialty Code (2022 OSSC) Site Class	F [1]	F [1]
Site Latitude	45.5205° N	
Site Longitude	123.0676° W	
S_s Mapped Spectral Acceleration for Short (0.2 second) Period [2]	0.909g	1.020g
S_1 Mapped Spectral Acceleration for 1 Second Period [2]	0.444g	0.420g

1. See above for site class discussion.
2. Seismic parameter values determined from the Applied Technology Council (ATC) website referenced in Section 1613.2.1 of the 2022 OSSC and the ASCE 7-22 online tool (https://asce7hazardtool.online/).

Based on our experience with structures similar to the proposed development, we anticipate that the fundamental period of the structure will be less than 0.5 seconds. For structures with fundamental periods of vibration equal to or less than 0.5 second, Section 20.3.1 of ASCE 7-16 allows site coefficients F_a and F_v to be determined from Tables 11.4-1 and 11.4-2 using the corresponding Site Class determined according to Section 20.3. Section 20.2.1 of ASCE 7-22 allows spectral accelerations may be determined in accordance with Section 11.4.

Provided the structure fundamental period is 0.5 second or less, the following code-prescribed parameters may be used for values of F_a and F_v: and the resultant S_{DS} and S_{D1}:

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Parameter	ASCE 7-16	ASCE 7-22
F_a Site Coefficient, 0.2 second	1.137[1]	1.265[2]
F_v Site Coefficient, 1.0 second	1.856[3]	2.143[2]
S_{DS}[3]	0.688g	0.860g
S_{D1}[3]	0.549g	0.600g

1. Seismic parameter values determined from the Applied Technology Council (ATC) website referenced in Section 1613.2.1 of the 2022 OSSC and the ASCE 7-22 online tool (https://asce7hazardtool.online/).
2. F_a and F_v are not provided by the ASCE 7 hazard tool; values are back-calculated using the following equations:
   $F_a = S_{ms}/S_s$ and $F_v = S_{m1}/S_1$
3. Value determined from 2022 OSSC Table 1613.2.3(2). Must meet criteria per ASCE 7-16 Section 11.4.8.

Liquefaction

We performed a site-specific liquefaction analysis based on empirical methods developed by Youd and Idriss (2014). The peak ground acceleration and moment magnitude used in the analysis were based on the PGA as required by the 2022 OSSC and factored for the site class coefficient. The risk for liquefaction of the non-plastic site soils encountered between the top of the groundwater surface and the top of the Hillsboro formation at about 45 feet bgs is high, and we estimate liquefaction-induced total settlements of approximately 6.4 inches could be experienced at the site. We anticipate up to 2/3 of the total settlement (or 4.3 inches) could be experienced as differential settlement. Based on Table 12.13-3 Differential Settlement Threshold of ASCE 7-16, a Site Risk Category of II, other single-story structures, and assumed length between footings of approximately 50 feet the code defines a differential settlement threshold of 9 inches to support the structure on shallow foundations.

Liquefaction – Lateral Spread

Lateral spreading is not a concern at this site due to the significant distance to a free face.

Seismic Settlement Discussion

The 2022 OSSC requires that liquefaction analyses be completed assuming a substantial earthquake with associated ground accelerations that are provided in ASCE 7-16 or ASCE 7-22. It is not the intent of ASCE 7-16 or ASCE 7-22 to require a building to be in an operable condition after such event. Rather, the ASCE 7-16 or ASCE 7-22 philosophy for seismic design is based on life safety with the intent of preventing building collapse

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because of the design earthquake. Owners should understand that buildings may not be in an operational condition even with mitigation measures after the design earthquake and significant repair or even demolition and reconstruction might be required. It, therefore, seems reasonable that designing a building for the potential impacts of liquefaction resulting from a design earthquake event should be based on the premise of preventing building collapse. Therefore, we recommend the building foundations be constructed on structural fill due to both static settlement considerations as well as maintaining bearing capacity during a seismic event in accordance with the recommendations provided in this report.

Geotechnical Characterization

Geology

The project is located in the Tualatin Basin, an approximately 35-mile-long by 20-mile-wide, northwest-to-southeast, elliptical structure that is surrounded by uplands: the Tualatin Mountains on the north and east, the Chehalem Mountains on the south, and the Coast Range on the west. Although part of the regional Puget–Willamette Lowland, the Tualatin Basin is partially isolated from the Willamette Lowland by a low topographic barrier on the south (Madin, 1990; Schlicker and Deacon, 1967; Wilson, 1998; Popowski, 1996).

The Neogene structural basement of the Tualatin Basin is composed of nearly 1,000 feet of middle Miocene (about 17 to 6 million years before the present time) lava flows, collectively referred to as the Columbia River Basalt Group (CRBG). During the late Miocene and Pliocene epochs (about 5 to 1.5 million years ago), complex folding and faulting of the CRBG produced the basin structure, including the surrounding uplands on the north, east, and south basin margins, as well as Cooper and Bull Mountains, which occur within the basin. These latter two structures have divided the Tualatin Basin into two sub-basins: a larger northern basin north of Cooper and Bull Mountains, and a smaller southeastern sub-basin.

Over the span of geologic time, sedimentary deposits consisting of clay, silt, sand, and minor fine gravel accumulated in the basins that formed on the CRBG surface. These sediments, which directly overlie the weathered surface of the CRBG, have been defined as the Hillsboro Formation (Wilson, 1998) of the upper Miocene to Pleistocene age. The Hillsboro Formation consists of up to about 860 feet of fine-grained fluvial and lacustrine sediments derived from the surrounding uplands.

During the glacial periods of the late Pleistocene epoch, several lakes developed behind ice dams at the margins of the continental glaciers in northeastern Washington, Idaho, and western Montana. Many of these flood episodes were so large that they back flooded

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up the Willamette and Tualatin River valleys, forming large temporary lakes. The "Missoula Floods" deposited up to 120 feet of micaceous clayey to fine sandy silt in the Tualatin Valley (Wilson, 1998). Except where they have been eroded or covered by younger alluvial sediments, the Missoula Flood deposits mantle all the older sediments in the Tualatin Valley below an elevation of about 250 feet (Schlicker and Deacon, 1967).

The Tualatin River and its many tributary creeks and streams have locally eroded the older sediments (principally Missoula Flood deposits) and re-deposited the sediment along their modern floodplains. These modern sedimentary deposits, or Holocene alluvium (less than 11,700 years), generally consist of soft clay, silt, fine-grained sand, and organic material with minor fine gravel. The thickness of the Holocene alluvium varies with location and is difficult to determine because there is little distinction between it and the Missoula Flood deposits from which it originated.

Across the project area, we interpreted the soils beneath the topsoil and fill materials to be Missoula Flood deposits over the Hillsboro Formation sediments.

Subsurface Profile

We have developed a general characterization of the subsurface conditions based on our review of the subsurface exploration, laboratory data, geologic setting, and our understanding of the project. This characterization, termed GeoModel, forms the basis of our geotechnical calculations and evaluation of the site. Conditions observed at each exploration point are indicated on the individual logs. The individual logs can be found in the **Exploration Results** and the GeoModel can be found in the **Figures** attachment of this report.

As part of our analyses, we identified the following model layers within the subsurface profile. For a more detailed view of the model layer depths at each boring location, refer to the GeoModel.

Model Layer	Layer Name	General Description
1	**Fill and Topsoil**	Topsoil, poorly graded gravel with silt and sand (GP-GM), Silt with sand (ML), and Silty gravel (GM): dark brown to gray, moist.
2	**Missoula Flood Deposit**	Silt with sand (ML), Sandy silt (ML), and Lean Clay with sand (CL): gray or light brown to brown, moist to wet.
3	**Hillsboro Formation**	Interpreted as: Lean clay (CL), soft to medium stiff Description from geologic map: Fine-grained fluvial and lacustrine sediments (typically

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Model Layer	Layer Name	General Description
		classified as lean clay) derived from the surrounding uplands.

Groundwater Conditions

We observed our explorations while drilling and after completion for the presence and level of groundwater. The water levels observed in the explorations are provided on the exploration logs in **Exploration and Laboratory Results** and are summarized below.

Boring Number[3]	Approximate Ground Surface Elevation (feet)[1]	Approximate Depth to Groundwater (feet)[2]	
		While Drilling	Immediately After Drilling
B-1	182	12	8.5
B-2	181	NR	7.0
B-3	181	12	7.8
B-4	181	7	NR
B-5	181	NR	8.5
P-2	183	NR	NR
P-6	179	5.0	3.7

1. Elevations obtained from Google Earth. The assumed ground surface elevation is presented on the exploration logs.
2. NR stands for not recorded.
3. Groundwater not encountered in exploration P-1, P-3, P-4 or P-5.

Groundwater level fluctuations occur due to seasonal variations in the amount of rainfall, runoff, and other factors not evident at the time the explorations were performed. Therefore, groundwater levels during construction or at other times in the life of the structure may be higher or lower than the levels indicated on the exploration logs. The possibility of groundwater level fluctuations should be considered when developing the design and construction plans for the project.

Geologic Hazards

Seismic Hazards

Seismic hazards resulting from earthquake motions can include slope stability, liquefaction, and surface rupture due to faulting or lateral spreading. Liquefaction is the

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phenomenon wherein soil strength is dramatically reduced when subjected to vibration or shaking.

We reviewed the Statewide Geohazards Viewer (HazVu) published by the Oregon Department of Geology and Mineral Industries (DOGAMI) and available online[1]. The viewer categorizes the expected earthquake shaking from light, moderate, strong, very strong, severe and violent, and the landslide susceptibility from low, moderate, high, and very high.

- Earthquake Liquefaction Hazard: Low
- Expected Earthquake Shaking: Severe
- Landslide Susceptibility (due to earthquake): Low

Nearby Faults

The United States Geological Survey (USGS) maintains the Quaternary Fault and Fold Database containing descriptions and locations of recently active faults within the United States. The three closest faults to the project site include the Gales Creek fault zone (No.718), the Beaverton fault zone (No.715), and the Helvetia fault (No.714). Published information pertaining to each fault or fault zone is provided in the following table:

Fault Name	Gales Creek fault zone	Beaverton fault zone	Helvetia fault
USGS Fault Number	718	715	714
USGS Fault Class	A	A	A
Distance from Site to Fault	4 mi W	7.25 mi NE	9 mi SE
Length of Fault	46 miles	9 miles	4 miles
Strike (degrees)	N41°W	N86°E	N26°W
Sense of Movement	Right lateral, Reverse	Unspecified	Right lateral
Dip Direction	Unknown	Unknown	Unknown
Slip-rate Category	Less than 0.2 mm/yr	Less than 0.2 mm/yr	Less than 0.2 mm/yr

[1] Statewide Geohazards Viewer (HazVu) published by the Oregon Department of Geology and Mineral Studies (DOGAMI) **https://gis.dogami.oregon.gov/hazvu/,** accessed June 2024

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Fault Name	Gales Creek fault zone	Beaverton fault zone	Helvetia fault
Most recent prehistoric deformation	Undifferentiated Quaternary (<1.6 Ma)	Middle and late Quaternary (<750 ka)	Undifferentiated Quaternary (<1.6 Ma)

Based on our review of the available fault information, the depth to bedrock, and the site's proximity to the nearest known faults, it is our opinion that the risk of surface rupture due to ground faulting is low.

Infiltration

We encountered a shallow groundwater level at the initial proposed infiltration test location at the NW corner of the site. For that reason, the infiltration test location was relocated next to P-2 location. The infiltration test in explorations IT-1 was performed using the encased falling head method using a 6.0-inch inside diameter PVC pipe. Before performing the infiltration test, we drilled a boring beside the proposed infiltration test location to a minimum of 5 feet below the infiltration test depth to identify underlying soil layers and existing groundwater levels in our test locations. We conducted the test in general accordance with the 1980 EPA Falling Head Procedure by first performing a minimum soaking period of 4 hours. At the end of the soaking period, we utilized 6 inches of water head to record the infiltration rate in approximate 10-minute increments until a relatively steady infiltration rate was observed, as provided in the table below. The table below summarizes the infiltration test data and provides our recommended minimum correction factor based on the test method.

Infiltration Test Result

Exploration ID	Approximate Exploration Elevation (ft)	Test Depth Below Grade (ft)	Adjoining Boring	Soil Type	Measured Infiltration Rate (in/hr)[1]
IT-1	183	5.8	P-2	Silt with sand	0.0

1. Recommended minimum correction factor of 2 is based on anticipated ambiguities and the long-term system degradation due to siltation, biofouling, crusting or other factors.

Unfortunately, based on the results of the infiltration test, we recommend other means of stormwater management be planned and implemented into design and construction at the site because the soil is not conducive to infiltration.

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Geotechnical Overview

The site appears suitable for the proposed construction based on the geotechnical conditions encountered in the test borings, provided that the recommendations provided in this report are implemented in the design and construction phases of this project.

The near-surface, soft to medium stiff fine-grained soil could become unstable with typical earthwork and construction traffic, especially after precipitation events. Drainage should be completed early in the construction sequence and maintained after construction to avoid potential issues. If possible, the grading should be performed during the warmer and drier times of the year. If grading is performed during the winter months, an increased risk for possible undercutting and replacement of unstable subgrade will persist. Additional site preparation recommendations, including subgrade improvement and fill placement, are provided in the **Earthwork** section.

The underlying subsurface soil is susceptible to liquefaction. However, we estimate that the magnitude of liquefaction can be tolerated within the design of the structure and still maintain life safety per ASCE 7. Therefore, the structure could be supported on shallow foundations.

The foundations should be supported on a minimum of 24 inches of Select Fill. Grading for the proposed foundations should incorporate the limits of the foundations plus a lateral distance beyond the outside edge of footings. Onsite soils are not considered suitable to be used as structural fill materials.

The canopy foundations can be supported on spread foundations. Due to the required lengths of piles to resist downdrag loads in a seismic event, drilled shafts are likely not to be cost-effective. Therefore, we have not provided drilled shaft recommendations.

Our opinion of pavement section thickness design has been developed based on our understanding of the intended use, assumed traffic, and subgrade preparation recommended herein using methodology contained in ACI 330 "Guide to Design and Construction of Concrete Parking Lots" NAPA IS-109 "Design of Hot Mix Asphalt Pavements" and adjusted with consideration to local practice or local/state design manual. The **Pavements** section includes our recommended parameters for subgrade support and minimum pavement thicknesses.

The recommendations contained in this report are based on the results of field and laboratory testing (presented in the **Exploration and Laboratory Results**), engineering analyses, and our current understanding of the proposed project. The **General Comments** section provides an understanding of the report's limitations.

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Earthwork

Earthwork is anticipated to include demolition, clearing and grubbing, excavations, and structural fill placement. The following sections provide recommendations for use in the preparation of specifications for the work. Recommendations include quality criteria necessary to render the site in the state considered in our geotechnical engineering evaluation for foundations, floor slabs, and pavements.

Demolition

The proposed development will be constructed within the footprint of existing houses which will need to be demolished, as well as exterior sidewalks, pavements, and utilities. We recommend existing foundations, slabs, and utilities be removed from within the proposed building footprint and at least 5 feet beyond the outer edge of foundations following structure demolition.

For areas outside the proposed building footprints and foundation-bearing zones, existing foundations, floor slabs, and utilities should be removed where they conflict with proposed utilities, retaining walls, and pavements. In such cases, existing foundations, floor slabs, and utilities should be removed to a depth of at least 2 feet below the affected utility or design pavement subgrade elevation.

It is important to note that previously developed sites in these urban environments often encountered buried abandoned utilities, tanks, or other remaining structures. Therefore, the contractor should be prepared to remove undocumented fill and/or other unsuitable materials within the proposed building pad and replace them with engineered fill per the **Earthwork** section of this report. See Terracon report 82247168 for the Environmental Site Assessment and environmental demolition concerns.

Site Preparation

Prior to placing fill, existing vegetation, topsoil, and root mats should be removed. Complete stripping of the topsoil should be performed in the proposed building and parking/driveway areas.

Mature trees are located within or near the footprint of the proposed building, which will require removal at the onset of construction. Tree root systems can remove substantial moisture from surrounding soils. Where trees are removed, the full root ball and all associated dry and desiccated soils should be removed. The soil materials that contain less than 5 percent organics can be reused as structural fill at selective locations provided the material is moisture-conditioned and properly compacted.

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Subgrade Preparation

We recommend removing all existing fills within the building footprint as recommended in the **Existing Fill** section. All subgrade should be evaluated by the Geotechnical Engineer or representative. The subgrade should be proof rolled with an adequately loaded vehicle such as a fully loaded tandem-axle dump truck. The proof rolling should be performed under the observation of the Geotechnical Engineer or representative. Areas excessively deflecting under the proof roll should be delineated and subsequently addressed by the Geotechnical Engineer. Such areas should either be removed or modified as a **Subgrade Stabilization** section. Excessively wet or dry material should either be removed or moisture-conditioned and recompacted.

All exposed areas that will receive fill, once properly cleared and benched where necessary, should be evaluated as described above under the observation of the Geotechnical Engineer. Compacted structural fill soils should then be placed to the proposed design grade, and the moisture content and compaction of subgrade soils should be maintained until foundation or pavement construction.

Based upon the subsurface conditions determined from the geotechnical exploration, subgrade soils exposed during construction are not anticipated to be workable; workability may be improved by our recommendations in the **Subgrade Stabilization** section.

Existing Fill

As noted in **Geotechnical Characterization**, our explorations encountered previously placed fill to depths up to 1.5 feet in 2 borings. We have no records to indicate the degree of control, and consequently, the fill is considered unreliable for support of shallow foundations or equipment slabs. Support of pavements on or above existing fill soils is discussed in this report. However, even with the recommended construction procedures, the inherent risk exists for the owner that compressible fill or unsuitable material, within or buried by the fill will not be discovered. This risk of unforeseen conditions cannot be eliminated without completely removing the existing fill but can be reduced by following the recommendations contained in this report.

If the owner elects to construct pavements on the existing fill, the following protocol should be followed. Once the planned subgrade elevation has been reached, the entire pavement area should be proofrolled. Areas of soft or otherwise unsuitable material should be undercut and replaced with new structural fill.

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Subgrade Stabilization

Methods of subgrade improvement, as described below, could include scarification, moisture conditioning and recompaction, removal of unstable materials and replacement with granular fill (with or without geosynthetics), and chemical stabilization. The appropriate method of improvement, if required, would be dependent on factors such as schedule, weather, the size of area to be stabilized, and the nature of the instability. More detailed recommendations can be provided during construction as the need for subgrade stabilization occurs. Performing site grading operations during warm seasons and dry periods would help reduce the amount of subgrade stabilization required.

If the exposed subgrade is unstable during proofrolling operations, it could be stabilized using one of the methods outlined below.

- **Scarification and Recompaction** - It may be feasible to scarify, dry, and recompact the exposed soils. The success of this procedure would depend primarily upon favorable weather and sufficient time to dry the soils. Stable subgrades likely would not be achievable if the thickness of the unstable soil is greater than about 1 foot, if the unstable soil is at or near groundwater levels, or if construction is performed during a period of wet or cool weather when drying is difficult.
- **Crushed Stone** - The use of crushed stone or crushed gravel is a common procedure to improve subgrade stability. Typical undercut depths would be expected to range from about 12 to 18 inches below the finished subgrade elevation. The use of high modulus geotextiles (i.e., engineering fabric or geogrid) could also be considered after underground work such as utility construction is completed. Prior to placing the fabric or geogrid, we recommend that all below-grade construction, such as utility line installation, be completed to avoid damaging the fabric or geogrid. Equipment should not be operated above the fabric or geogrid until one full lift of crushed stone fill is placed above it. The maximum particle size of granular material placed over geotextile fabric or geogrid should not exceed 1-1/2 inches.
- **Chemical Modification** - Improvement of subgrades with portland cement or class C fly ash could be considered for improving unstable soils. The chemical modification should be performed by a pre-qualified contractor having experience with successfully stabilizing subgrades in the project area on similar-sized projects with similar soil conditions. Results of chemical analysis of the additive materials should be provided to the geotechnical engineer before use. The hazards of chemicals blowing across the site or onto adjacent property should also be considered. Additional testing would be needed to develop specific recommendations to improve subgrade stability by blending chemicals with the site soils. Additional testing could include, but not be limited to, determining the most suitable stabilizing agent, the optimum amounts required, the presence of sulfates in the soil, and the freeze-thaw durability of the subgrade.

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Further evaluation of the need and recommendations for subgrade stabilization can be provided during construction as the geotechnical conditions are exposed.

Fill Material Types

Fill required to achieve design grade should be classified as structural fill and general fill. Structural fill is material used below, or within 10 feet of structures, pavements, or constructed slopes. General fill is material used to achieve grades outside of these areas.

Reuse of On-Site Soil: Excavated on-site soil are not suitable for reuse as Structural Fill and should not be placed beneath settlement-sensitive structures and within foundation-bearing zones. The on-site soils have an elevated fines content and will be sensitive to moisture conditions (particularly during seasonally wet periods) and may not be suitable for reuse when above optimum moisture content.

Fill Materials: Structural fill materials should meet the following material property requirements. Regardless of its source, compacted fill should consist of approved materials that are free of organic matter and debris. Frozen material should not be used, and fill should not be placed on a frozen subgrade.

Fill Type [1]	Specifications	Acceptable Location for Placement (for Structural Fill)
Common Fill	Oregon Department of Transportation Standard Specifications for Construction (ODOT SSC) Section 00330.13 Selected General Backfill (Maximum PI = 10% and LL = 40%)	All locations across the site except under the foundation subgrade and within the upper 12 inches of slab subgrade. Dry weather is only acceptable
Select Fill	ODOT SSC Section 00330.14 Selected Granular Backfill [2]	All locations across the site. Wet and dry weather is acceptable.
Crushed Aggregate Base Course (CABC)	ODOT SSC Section 02630.10 Dense Graded Aggregate (2"-0 to ¾"-0) [2]	All locations across the site. Wet and dry weather is acceptable.
Trench Backfill	ODOT SSC Section 00405.14 for Trench Backfill with additional stipulations [4]	Acceptable materials include Select Fill listed above.

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Fill Type [1]	Specifications	Acceptable Location for Placement (for Structural Fill)
Subgrade Stabilization	ODOT SSC Section 00330.14 for Selected Granular Backfill above groundwater seepage and OSSC Section 00330.16 for Stone Embankment Material with additional stipulations [4]	12-inch compacted lift in wet or soft subgrades encountered in the subgrade and other utility excavations.
Bedding & Haunching	ODOT SSC Section 00405.13, Pipe Zone Material	Thickness above and below the pipe recommended by the Civil or MEP Engineer

1. Controlled, compacted fill should consist of approved materials that are free (free = less than 3% by weight) of organic matter and debris (i.e. wood sticks greater than ½ inch in diameter). A sample of each material type should be submitted to the geotechnical engineer for evaluation.
2. Material should have a maximum aggregate size of 2 inches, and a minimum laboratory CBR of 20% for granular soils, and no more than 8% passing the No. 200 sieve by weight determined by ASTM D6913. Fines should have a Plasticity Index (PI) of less than 20% per ASTM D4318. Reclaimed glass will not be accepted.
3. The contractor shall select the appropriate material for use based on the current and forecasted weather conditions at the time of construction.
4. Maximum aggregate size shall be limited to 2½ inches.

Fill Placement and Compaction Requirements

Structural and general fill should meet the following compaction requirements.

Item	Structural Fill
Maximum Lift Thickness	8 inches or less in loose thickness when heavy, self-propelled compaction equipment is used 4 to 6 inches in loose thickness when hand-guided equipment (i.e. jumping jack or plate compactor) is used
Minimum Compaction Requirements [1,2,3]	95% of max. above and below foundations and within 2 feet of finished pavement subgrade 92% of max. when more than 2 feet below the finished pavement subgrade
Water Content Range [1]	Common Fill, Select Fill, & CABC: -2% to +2% of optimum

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Item	Structural Fill

1. Maximum density and optimum water content as determined by the modified Proctor test (ASTM D1557).
2. If the granular material is a coarse sand or gravel, of a uniform size, or has a low fines content, compaction comparison to relative density may be more appropriate. In this case, granular materials should be compacted to at least 70% relative density (ASTM D4253 and D4254). Materials not amenable to density testing should be placed and compacted to a stable condition observed by the Geotechnical Engineer or representative.

Dewatering

Due to groundwater seepage levels encountered, as shallow as 3.7 feet below the ground surface (bgs), groundwater should be expected within excavations exceeding about 3 feet. Based on our observations, this groundwater is likely perched and could vary significantly with the seasons. The contractor should be prepared to control these areas of localized groundwater seepage in the excavations. Construction activity should be monitored and should be curtailed if the construction activity is causing subgrade disturbance. A Terracon representative can help with monitoring and developing recommendations to aid in limiting subgrade disturbance

We anticipate that dewatering for site preparations as well as subgrade preparations will be necessary for utility trenches. We provide the following recommendations for incorporation into the project specifications with respect to dewatering:

- The contractor should be made responsible for designing, permitting, and constructing dewatering system using accepted and professional methods consistent with current industry practice to eliminate water entering the excavation under hydrostatic head from the bottom or sides.
- The dewatering system should be of sufficient size and capacity to prevent ground and surface water flow into the excavation and to allow work to be installed in a dry condition (i.e. no standing water) that maintains the stability of the subgrade soils.
- The contractor should be responsible for obtaining discharge permits and designing settling basins, as necessary by permit, for the pumped water and performing water quality testing that may be required by regulatory agencies including but not limited to the Oregon Department of Environmental Quality. All data and other submittals required by regulatory agencies shall be submitted to the owner and Civil Engineer.

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Utility Trench Backfill

Any soft or unsuitable materials encountered at the bottom of utility trench excavations should be removed and replaced with structural fill or bedding material in accordance with public works specifications for the utility to be supported. This recommendation is particularly applicable to utility work requiring grade control and/or in areas where subsequent grade raising could cause settlement in the subgrade supporting the utility. Trench excavation should not be conducted below a downward 1:1 projection from existing foundations without an engineering review of shoring requirements and geotechnical observation during construction.

On-site materials are not considered suitable for the backfill of utility and pipe trenches. Granular soils are recommended for trench backfill in structural areas due to their relative ease of compaction in confined areas as opposed to cohesive soils.

Trench backfill should be mechanically placed and compacted as discussed earlier in this report. Compaction of initial lifts should be accomplished with hand-operated tampers or other lightweight compactors. Where trenches are placed beneath slabs or footings, the backfill should satisfy the gradation and expansion index requirements of the engineered fill discussed in this report. Flooding or jetting for placement and compaction of backfill is not recommended.

Grading and Drainage

All grades must provide effective drainage away from the building during and after construction and should be maintained throughout the life of the structure. Water retained next to the building can result in soil movements greater than those discussed in this report. Greater movements can result in unacceptable differential floor slab and/or foundation movements, cracked slabs and walls, and roof leaks. The roof should have gutters/drains with downspouts that discharge onto splash blocks at a distance of at least 10 feet from the building.

The exposed ground should be sloped and maintained at a minimum of 5 percent away from the building for at least 10 feet beyond the perimeter of the building. Locally, flatter grades may be necessary to transition ADA access requirements for flatwork. After building construction and landscaping have been completed, final grades should be verified to document that effective drainage has been achieved. Grades around the structure should also be periodically observed and adjusted, as necessary, as part of the structure's maintenance program. Where paving or flatwork abuts the structure, a maintenance program should be established to effectively seal and maintain joints and prevent surface water infiltration.

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Earthwork Construction Considerations

Shallow excavations for the proposed structure are anticipated to be accomplished with conventional construction equipment. Upon completion of filling and grading, care should be taken to maintain the subgrade water content prior to construction of grade-supported improvements such as floor slabs and pavements. Construction traffic over the completed subgrades should be avoided. The site should also be graded to prevent ponding of surface water on the prepared subgrades or in excavations. Water collecting over or adjacent to construction areas should be removed. If the subgrade freezes, desiccates, saturates, or is disturbed, the affected material should be removed, or the materials should be scarified, moisture conditioned, and recompacted prior to floor slab construction.

As a minimum, excavations should be performed in accordance with OSHA 29 CFR, Part 1926, Subpart P, "Excavations" and its appendices, and in accordance with any applicable local and/or state regulations.

Construction site safety is the sole responsibility of the contractor who controls the means, methods, and sequencing of construction operations. Under no circumstances shall the information provided herein be interpreted to mean Terracon is assuming responsibility for construction site safety or the contractor's activities; such responsibility shall neither be implied nor inferred.

Excavations or other activities resulting in ground disturbance have the potential to affect adjoining properties and structures. Our scope of services does not include a review of available final grading information or consider potential temporary grading performed by the contractor for potential effects such as ground movement beyond the project limits. A preconstruction/precondition survey should be conducted to document nearby property/infrastructure prior to any site development activity. Excavation or ground disturbance activities adjacent or near property lines should be observed or instrumented for potential ground movements that could negatively affect adjoining property and/or structures.

Construction Observation and Testing

The earthwork efforts should be observed by the Geotechnical Engineer (or others under their direction). Observation should include documentation of adequate removal of surficial materials (vegetation, topsoil, and pavements), evaluation and remediation of existing fill materials, as well as proofrolling and mitigation of unsuitable areas delineated by the proofroll.

Each lift of compacted fill should be tested, evaluated, and reworked, as necessary, as recommended by the Geotechnical Engineer prior to placement of additional lifts. Each lift of fill should be tested for density and water content at a frequency of at least one

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test for every 1,250 square feet of compacted fill in the building areas and 5,000 square feet in pavement areas. Where not specified by local ordinance, one density and water content test should be performed for every 100 linear feet of compacted utility trench backfill and a minimum of one test performed for every 12 vertical inches of compacted backfill.

In areas of foundation excavations, the bearing subgrade should be evaluated by the Geotechnical Engineer. If unanticipated conditions are observed, the Geotechnical Engineer should prescribe improvement options.

In addition to the documentation of the essential parameters necessary for construction, the continuation of the Geotechnical Engineer into the construction phase of the project provides the continuity to maintain the Geotechnical Engineer's evaluation of subsurface conditions, including assessing variations and associated design changes.

Shallow Foundations

If the site has been prepared in accordance with the requirements noted in **Earthwork**, the following design parameters are applicable for shallow foundations.

Design Parameters – Compressive Loads

Item	Description
Maximum Net Allowable Bearing Pressure [1, 2]	2,000 psf - foundation bearing on a minimum of 24-inches of Select Fill extended to undisturbed native soils.
Required Bearing Stratum [3]	24-inches Select Fill over undisturbed native soil
Minimum Foundation Dimensions	Columns: 5 foot square to satisfy the assumed maximum load of 50 kips Continuous: 18 inches to satisfy the assumed maximum load of 2 klf
Ultimate Passive Resistance [4] **(equivalent fluid pressures)**	420 pcf (granular backfill)
Sliding Resistance [5]	0.4 allowable coefficient of friction - granular material
Minimum Embedment below Finished Grade [6]	12 inches (Washington County Frost depth)

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Item	Description
Estimated Total Settlement from Structural Loads [2]	Less than about 1 inch
Estimated Differential Settlement [2, 7]	About 2/3 of the total settlement

1. The maximum net allowable bearing pressure is the pressure in excess of the minimum surrounding overburden pressure at the footing base elevation. Values assume that exterior grades are no steeper than 20% within 10 feet of the structure. These values can be increased by 1/3 for short-term wind and seismic loading condition cases.
2. Values provided are for maximum loads noted in **Project Description**. Additional geotechnical consultation will be necessary if higher loads are anticipated.
3. Unsuitable or soft soils should be overexcavated and replaced per the recommendations presented in the **Earthwork** section.
4. Use of passive earth pressures require the sides of the excavation for the spread footing foundation to be nearly vertical and the concrete placed neat against these vertical faces or that the footing forms be removed and compacted structural fill be placed against the vertical footing face. Assumes no hydrostatic pressure.
5. Can be used to compute sliding resistance where foundations are placed on suitable soil/materials. Frictional resistance for granular materials is dependent on the bearing pressure which may vary due to load combinations. For fine-grained materials, lateral resistance using cohesion should not exceed ½ the dead load.
6. Embedment necessary to minimize the effects of frost and/or seasonal water content variations.
7. Differential settlements are noted for equivalent-loaded foundations and bearing elevation as measured over a span of 50 feet.

Footing Drains

A perforated rigid plastic drain line should be installed at the base of footings along the perimeter of the structures. The invert of a drain line around a building area or exterior retaining wall should be placed near the foundation bearing level. The drain line should be sloped to provide positive gravity drainage to daylight or to a sump pit and pump. The drain line should be surrounded by clean, free-draining granular material meeting the specifications for Select Fill as defined in the **Fill Material Types** section. The free-draining aggregate should be encapsulated in a filter fabric. The granular fill should extend to within 2 feet of the final grade, where it should be capped with compacted native material to reduce infiltration of surface water into the drain system.

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Design Parameters – Overturning and Uplift Loads

Shallow foundations subjected to overturning loads should be proportioned such that the resultant eccentricity is maintained in the center third of the foundation (e.g., e < b/6, where b is the foundation width). This requirement is intended to keep the entire foundation area in compression during the extreme lateral/overturning load event. Foundation oversizing may be required to satisfy this condition.

Uplift resistance of spread footings can be developed from the effective weight of the footing and the overlying soils with consideration to the IBC basic load combinations.

Item	Description
Soil Moist Unit Weight	110 pcf
Soil Effective Unit Weight [1]	47 pcf
Soil Weight Included in Uplift Resistance	Soil included within the prism extending up from the top perimeter of the footing at an angle of 20 degrees from vertical to ground surface

1. Effective (or buoyant) unit weight should be used for soil above the foundation level and below the shallowest anticipated groundwater level. The high groundwater level should be used in uplift design as applicable.

Foundation Construction Considerations

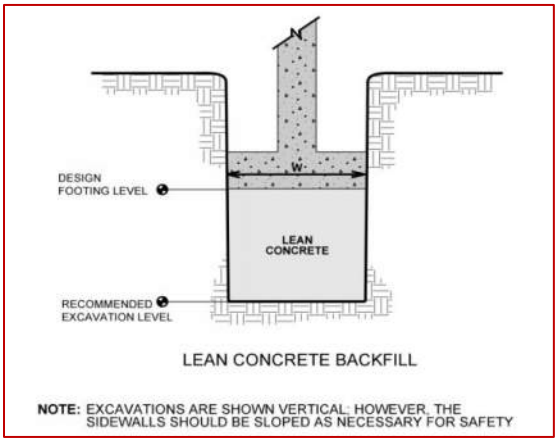
As noted in **Earthwork**, the base of footing excavations should be observed by the Geotechnical Engineer or their representative. The base of all foundation excavations should be free of water and loose soil, prior to placing concrete. Concrete should be placed soon after excavating to reduce bearing soil disturbance. Care should be taken to prevent wetting or drying of the bearing materials during construction. Excessively wet or dry material or any loose/disturbed material in the bottom of the footing excavations should be removed/reconditioned before foundation concrete is placed.

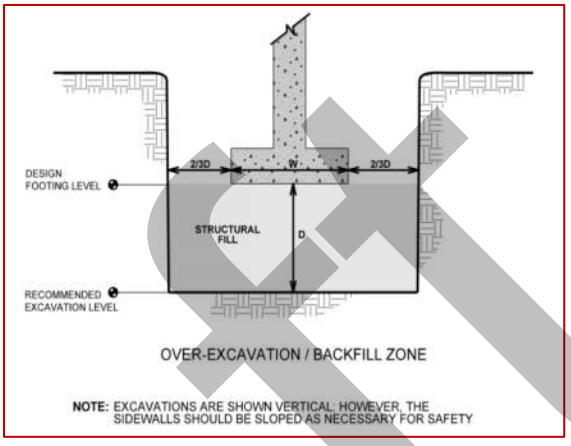
Sensitive soils exposed at the surface of footing excavations may require surficial compaction with hand-held dynamic compaction equipment prior to placing structural fill, steel, and/or concrete. Should surficial compaction not be adequate, construction of a working surface consisting of either crushed stone or a lean concrete mud mat may be required prior to the placement of reinforcing steel and construction of foundations.

If unsuitable bearing soils are observed at the base of the planned footing excavation, the excavation should be extended deeper to suitable soils, and the footings could bear directly on these soils at the lower level or on a lean concrete backfill placed in the excavations. The lean concrete replacement zone is illustrated on the sketch below. Overexcavation for structural fill placement below footings should be conducted as

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shown below. The over excavation should be backfilled up to the footing base elevation, with describe soil type placed, as recommended in the **Earthwork** section.





Drilled Shaft Foundations

Drilled shafts after installation may be subjected to additional axial compression loading due to drag forces when the soils in contact with the shaft move downward and tend to "drag" the shaft downward. Possible development of drag loads on shafts should be considered where: (1) the site is underlain by compressible silts, clays, or peats; (2) fill has recently been placed; (3) the groundwater is substantially lowered; and (4) settlement of soils due to seismic liquefaction. For this site, conditions 1 and 4 apply.

Due to the shallow groundwater and required lengths of piles to resist downdrag loads in a seismic event, approximately 55 feet below the ground surface, drilled shafts are likely not to be a cost-effective solution. Therefore, we have not provided drilled shaft recommendations. The canopy foundations can be supported on spread foundations.

Floor Slabs

Design parameters for floor slabs assume the requirements for **Earthwork** have been followed. Specific attention should be given to positive drainage away from the structure and positive drainage of the aggregate base beneath the floor slab.

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Floor Slab Design Parameters

Item	Description
Floor Slab Support [1]	Minimum 6 inches of free draining (less than 5% passing the U.S. No. 200 sieve) crushed aggregate compacted to at least 95% of ASTM D 1557 [2, 3] Subgrade compacted to recommendations in **Earthwork**
Estimated Modulus of Subgrade Reaction [2]	120 pounds per square inch per inch (psi/in) for point loads

1. Floor slabs should be structurally independent of building footings or walls to reduce the possibility of floor slab cracking caused by differential movements between the slab and foundation.
2. Modulus of subgrade reaction is an estimated value based upon our experience with the subgrade condition, the requirements noted in **Earthwork**, and the floor slab support as noted in this table. It is provided for point loads. For large area loads the modulus of the subgrade reaction would be lower.
3. Free-draining granular material should have less than 5% fines (material passing the No. 200 sieve). Other design considerations such as cold temperatures and condensation development could warrant more extensive design provisions.

The use of a vapor retarder should be considered beneath concrete slabs on grade covered with wood, tile, carpet, or other moisture-sensitive or impervious coverings, when the project includes humidity-controlled areas, or when the slab will support equipment sensitive to moisture. When conditions warrant the use of a vapor retarder, the slab designer should refer to ACI 302 and/or ACI 360 for procedures and cautions regarding the use and placement of a vapor retarder.

Saw-cut contraction joints should be placed in the slab to help control the location and extent of cracking. For additional recommendations, refer to the ACI Design Manual. Joints or cracks should be sealed with a waterproof, non-extruding compressible compound specifically recommended for heavy-duty concrete pavement and wet environments.

Where floor slabs are tied to perimeter walls or turn-down slabs to meet structural or other construction objectives, our experience indicates differential movement between the walls and slabs will likely be observed in adjacent slab expansion joints or floor slab cracks beyond the length of the structural dowels. The Structural Engineer should account for potential differential settlement through use of sufficient control joints, appropriate reinforcing, or other means.

Draft

Settlement of floor slabs supported on existing fill materials cannot be accurately predicted but could be larger than normal and result in some cracking. Mitigation measures, as noted in **Existing Fill** within **Earthwork**, are critical to the performance of floor slabs. In addition to the mitigation measures, the floor slab can be stiffened by adding steel reinforcement, grade beams, and/or post-tensioned elements.

Floor Slab Construction Considerations

The finish subgrade, within and for at least 10 feet beyond the floor slab, should be protected from traffic, rutting, or other disturbance and maintained in a relatively moist condition until floor slabs are constructed. If the subgrade should become damaged or desiccated prior to construction of floor slabs, the affected material should be removed, and structural fill should be added to replace the resulting excavation. Final conditioning of the finished subgrade should be performed immediately prior to placement of the floor slab support course.

The Geotechnical Engineer should observe the condition of the floor slab subgrades immediately prior to placement of the floor slab support course, reinforcing steel, and concrete. Attention should be paid to high-traffic areas that were rutted and disturbed earlier, and to areas where backfilled trenches are located.

Pavements

General Pavement Comments

Pavement designs are provided for the traffic conditions and pavement life conditions as noted in **Project Description** and in the following sections of this report. A critical aspect of pavement performance is site preparation. Pavement designs noted in this section must be applied to the site which has been prepared as recommended in the **Earthwork** section.

Pavement Design Parameters

Based on the results of the Army Corp Dynamic Cone Penetrometer (DCP) testing a California Bearing Ratio (CBR) of 3 was used for the subgrade for the asphaltic concrete (AC) pavement designs. A modulus of subgrade reaction of 20,000 pci was used for the portland cement concrete (PCC) pavement designs. The value was empirically derived based upon our experience with the silty subgrade soils and our expectation of the quality of the subgrade as prescribed by the **Site Preparation** conditions as outlined in **Earthwork**. A modulus of rupture of 550 psi was used in the design for the concrete (based on correlations with a minimum 28-day compressive strength of 4,000 psi).

Draft

Based on our expectation that the parking area will be subjected to automobile traffic only and that the drive areas will be subjected to a maximum of five delivery trucks/trash collection trucks per week, it is our opinion that Chick-fil-A's minimum pavement sections noted below are acceptable for this site.

Pavement Section Thicknesses

The following table provides our opinion of minimum thickness for pavement sections:

Layer	Pavement Section Thickness (inches)[1]					
	Section	Asphaltic Concrete[2]		Portland Cement Concrete[3]	Aggregate Base Course	Geotextile[4]
		Surface Course	Binder Course			
Parking (Light Duty)	ACC	2	2	---	12	Yes
	PCC	---	---	5	6	Yes
Drive-Though/Canopy (Heavy Duty)	ACC	2	2	---	14	Yes
	PCC	---	---	6	6	Yes
Dumpster Pad	PCC	---	---	7	6	Yes

1. See **Project Description** for more specifics regarding traffic assumptions.
2. All materials should meet the Oregon Department of Transportation Standard Specifications for Construction (ODOT SSC).
   - Asphaltic Surface - ODOT SSC Type A Asphaltic Cement Concrete: Section 00744
   - Asphaltic Base – ODOT SSC Type B Asphaltic Cement Concrete, Class I: Section 00745
3. All materials should meet the current ODOT SSC.
   - Concrete Pavement - ODOT SSC Portland Cement Concrete Type C: Section 00756
4. Geotextile should have similar qualities as the Mirafi HP370. The Geotechnical Engineer should review the geotextile submittal if an alternative product is selected.

Areas for parking of heavy vehicles, concentrated turn areas, and start/stop maneuvers could require thicker pavement sections. Edge restraints (i.e. concrete curbs or

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aggregate shoulders) should be planned along curves and areas of maneuvering vehicles.

Although not required for structural support, a minimum 6-inch-thick base course layer is recommended to help reduce potential for slab curl, shrinkage cracking, and subgrade pumping through joints and for constructability considerations. Proper joint spacing will also be required to prevent excessive slab curling and shrinkage cracking. Joints should be sealed to prevent entry of foreign material and doweled where necessary for load transfer. PCC pavement details for joint spacing, joint reinforcement, and joint sealing should be prepared in accordance with ACI 330 and ACI 325.

Where practical, we recommend early-entry cutting of crack-control joints in PCC pavements. Cutting of the concrete in its "green" state typically reduces the potential for micro-cracking of the pavements prior to the crack control joints being formed, compared to cutting the joints after the concrete has fully set. Micro-cracking of pavements may lead to crack formation in locations other than the sawed joints, and/or reduction of fatigue life of the pavement.

Openings in pavements, such as decorative landscaped areas, are sources for water infiltration into surrounding pavement systems. Water can collect in the islands and migrate into the surrounding subgrade soils thereby degrading support of the pavement. Islands with raised concrete curbs, irrigated foliage, and low permeability near-surface soils are particular areas of concern. The civil design for the pavements with these conditions should include features to restrict or collect and discharge excess water from the islands. Examples of features are edge drains connected to the stormwater collection system, longitudinal subdrains, or other suitable outlets and impermeable barriers preventing lateral migration of water such as a cutoff wall installed to a depth below the pavement structure.

Pavement Structural Support of 80,000-lb. Truck

Based on the minimum pavement section design thickness defined above and the anticipated amount of fill to be placed onsite, the structural pavement section has adequate bearing capacity to support an 80,000-lb truck, as long as the fill materials are placed in a controlled manner and meet the requirements defined in the **Fill Material Types** and **Fill Compaction Requirements** section. It should be noted that while the structural support capacity of the pavement is adequate for the fire truck loading, it is important to note that additional maintenance of the pavement (i.e. crack sealing) may be necessary following loading from fire truck emergency use.

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Pavement Drainage

Openings in pavements, such as decorative landscaped areas, are sources for water infiltration into surrounding pavement systems. Water can collect in the islands and migrate into the surrounding subgrade soils thereby degrading support of the pavement. Islands with raised concrete curbs, irrigated foliage, and low permeability near-surface soils are particular areas of concern. The civil design for the pavements with these conditions should include features to restrict or collect and discharge excess water from the islands. Examples of features are edge drains connected to the stormwater collection system, longitudinal subdrains, or other suitable outlets and impermeable barriers preventing lateral migration of water such as a cutoff wall installed to a depth below the pavement structure.

Pavements should be sloped to provide rapid drainage of surface water. Water allowed to pond on or adjacent to the pavements could saturate the subgrade and contribute to premature pavement deterioration. In addition, the pavement subgrade should be graded to provide positive drainage within the granular base section. Appropriate sub-drainage or connection to a suitable daylight outlet should be provided to remove water from the granular subbase.

Pavement Maintenance

The pavement sections represent minimum recommended thicknesses and, as such, periodic upkeep should be anticipated. Preventive maintenance should be planned and provided for through an on-going pavement management program. Maintenance activities are intended to slow the rate of pavement deterioration and to preserve the pavement investment. Pavement care consists of both localized (e.g., crack and joint sealing and patching) and global maintenance (e.g., surface sealing). Additional engineering consultation is recommended to determine the type and extent of a cost-effective program. Even with periodic maintenance, some movements and related cracking may still occur, and repairs may be required.

Pavement performance is affected by its surroundings. In addition to providing preventive maintenance, the civil engineer should consider the following recommendations in the design and layout of pavements:

5. Final grade adjacent to paved areas should slope down from the edges at a minimum 2%.
6. Subgrade and pavement surfaces should have a minimum 2% slope to promote proper surface drainage.
7. Install pavement drainage systems surrounding areas anticipated for frequent wetting.
8. Install joint sealant and seal cracks immediately.

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9. Seal all landscaped areas in or adjacent to pavements to reduce moisture migration to subgrade soils.

General Comments

Our analysis and opinions are based upon our understanding of the project, the geotechnical conditions in the area, and the data obtained from our site exploration. Variations will occur between exploration point locations or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident until during or after construction. Terracon should be retained as the Geotechnical Engineer, where noted in this report, to provide observation and testing services during pertinent construction phases. If variations appear, we can provide further evaluation and supplemental recommendations. If variations are noted in the absence of our observation and testing services on-site, we should be immediately notified so that we can provide evaluation and supplemental recommendations.

Our Scope of Services does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

Our services and any correspondence are intended for the sole benefit and exclusive use of our client for specific application to the project discussed and are accomplished in accordance with generally accepted geotechnical engineering practices with no third-party beneficiaries intended. Any third-party access to services or correspondence is solely for information purposes to support the services provided by Terracon to our client. Reliance upon the services and any work product is limited to our client and is not intended for third parties. Any use or reliance of the provided information by third parties is done solely at their own risk. No warranties, either express or implied, are intended or made.

Site characteristics as provided are for design purposes and not to estimate excavation cost. Any use of our report in that regard is done at the sole risk of the excavating cost estimator as there may be variations on the site that are not apparent in the data that could significantly affect excavation cost. Any parties charged with estimating excavation costs should seek their own site characterization for specific purposes to obtain the specific level of detail necessary for costing. Site safety and cost estimating including excavation support and dewatering requirements/design are the responsibility of others. Construction and site development have the potential to affect adjacent properties. Such impacts can include damages due to vibration, modification of groundwater/surface water flow during construction, foundation movement due to undermining or subsidence from excavation, as well as noise or air quality concerns. Evaluation of these items on

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nearby properties are commonly associated with contractor means and methods and are not addressed in this report. The owner and contractor should consider a preconstruction/precondition survey of surrounding development. If changes in the nature, design, or location of the project are planned, our conclusions and recommendations shall not be considered valid unless we review the changes and either verify or modify our conclusions in writing.

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Figures

Contents:

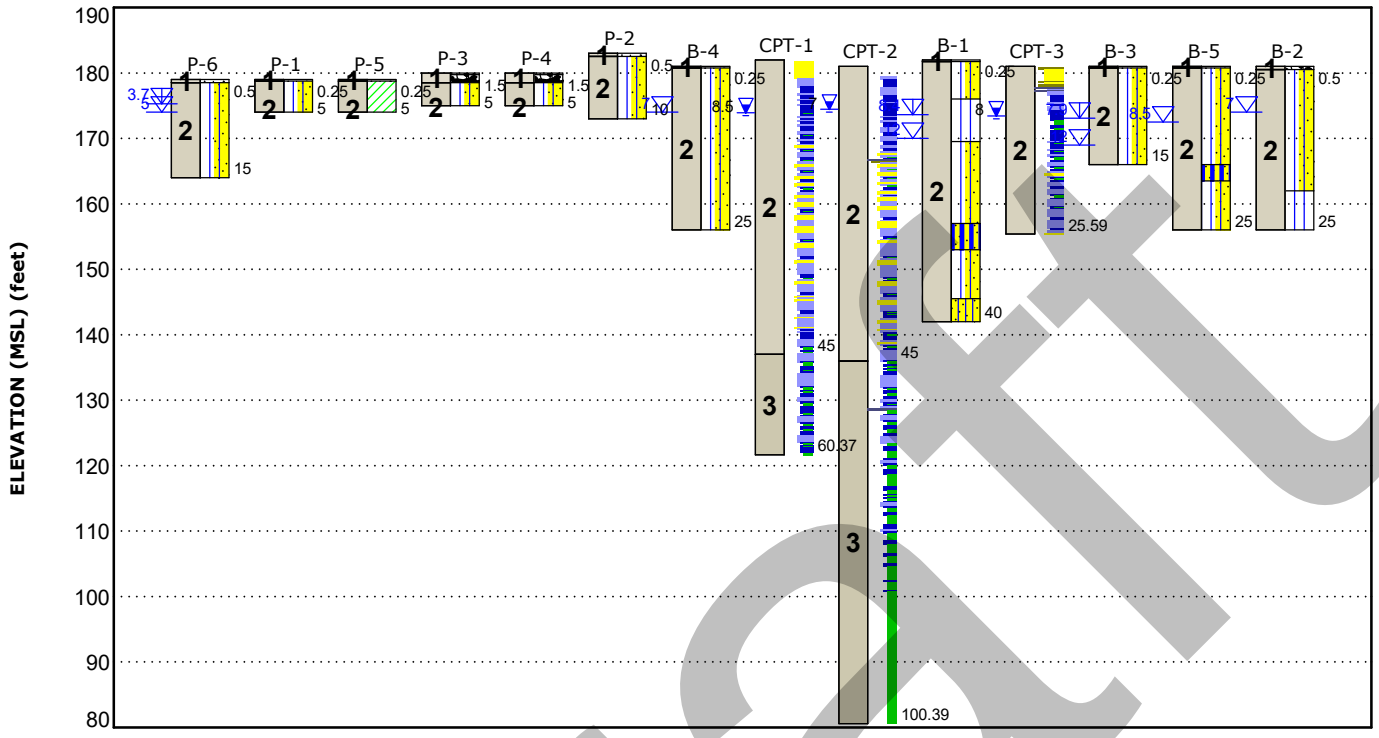
GeoModel

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Chick- Fil-A Hwy 8 & 4th Avenue FSU 05889
W Baseline Street and N 4th Avenue | Cornelius, OR
Terracon Project No. 82245055

Terracon
700 NE 55th Ave
Portland, OR

GeoModel



This is not a cross section. This is intended to display the Geotechnical Model only. See individual logs for more detailed conditions.

Model Layer	Layer Name	General Description
1	Fill and Topsoil	Topsoil, Poorly graded gravel with silt and sand (GP-GM), Silt with sand (ML), and Silty gravel (GM): dark brown to gray, moist.
2	Missoula Flood Deposit	Silt with sand (ML), Sandy silt (ML), and Lean Clay with sand (CL): gray or light brown to brown, moist to wet.
3	Hillsboro Formation	Interpreted as Lean clay (CL), soft to medium stiff Description from geologic map: Fine-grained fluvial and lacustrine sediments (typically classified as lean clay) derived from the surrounding uplands.

Legend

- Topsoil
- Silt with Sand
- Silt
- Sandy Silt
- Silty Sand
- Fill
- Lean Clay

▽ First Water Observation
▽ Second Water Observation

Groundwater levels are temporal. The levels shown are representative of the date and time of our exploration. Significant changes are possible over time.
Water levels shown are as measured during and/or after drilling. In some cases, boring advancement methods mask the presence/absence of groundwater. See individual logs for details.

NOTES:
Layering shown on this figure has been developed by the geotechnical engineer for purposes of modeling the subsurface conditions as required for the subsequent geotechnical engineering for this project. Numbers adjacent to soil column indicate depth below ground surface.

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Attachments

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Exploration and Testing Procedures

Field Exploration

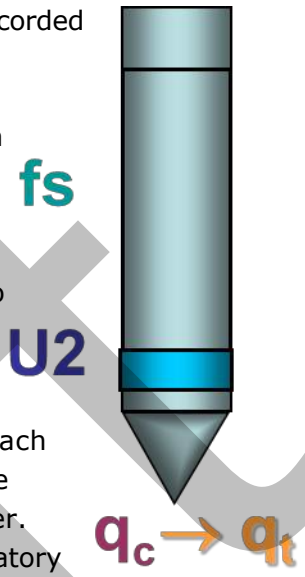
Number of Borings	Approximate Boring Depth (feet)	Location
B-1	40	Proposed building location
CPT-1	60	Proposed building location
B-2	25	Proposed building location
CPT-2	100	Proposed building location
B-3	15	Proposed canopy location
CPT-3	25.5	Proposed canopy location
B-4	25	Proposed building location
B-5	25	Proposed building location
P-1	5	Proposed paving area
P-2	10	Proposed paving area
P-3	5	Proposed paving area
P-4	5	Proposed paving area
P-5	5	Proposed paving area
P-6/Proposed IT-1	15	Proposed stormwater management facility/ Paving area

Boring Layout and Elevations: Terracon personnel provided the exploration layout using handheld GPS equipment (estimated horizontal accuracy of about ±20 feet) and referencing existing site features. Approximate ground surface elevations were estimated using Google Earth. If elevations and a more precise exploration layout are desired, we recommend explorations be surveyed.

Cone Penetrometer Test (CPT) Explorations: Three (3) CPT explorations were advanced with a track mounted rig under subcontract to Terracon. A continuous profile of the subsurface is obtained to the termination depth of the CPT. The CPT hydraulically pushes an

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instrumented cone through the soil while nearly continuous readings are recorded to a portable computer. The cone is equipped with electronic load cells to measure tip resistance and sleeve resistance and a pressure transducer to measure the generated ambient pore pressure. The face of the cone has an apex angle of 60° and an area of 10 cm^2. Digital data representing the tip resistance, friction resistance, pore water pressure, and probe inclination angle are recorded while advancing through the ground at a rate between 1½ and 2½ centimeters per second. These measurements are correlated to various soil properties used for geotechnical design.



CPT explorations do not retrieve soil samples. Therefore, we advanced push-probe soil borings with a track-mounted GeoProbe rig adjacent to each CPT location. Continuous samples were obtained within the depth of the borings. Soil sampling was performed using the GeoProbe push sampler. The samples were placed in appropriate containers, taken to our soil laboratory for testing, and classified by a geotechnical engineer. We observed and recorded groundwater levels during drilling and sampling, as well.

Army Corp Dynamic Cone Penetrometer Testing: In addition, an Army Dynamic Cone Penetrometer (DCP) were conducted, according to STP 399, in the upper 3 feet of each GeoProbe locations in proposed paving area except P-6 to correlate California Bearing Ratio soil strength parameters.

Infiltration Testing: One infiltration test was conducted within the stormwater management areas at the site. The tests were conducted in general accordance with the 1980 EPA Encased Falling Head test method as referenced in 2007 Washington County On-Site Stormwater Disposal System (OSDS) Design and Construction Minimum Guidelines and Requirements. Details of the testing are presented in the **Infiltration** section of this report. Results of the infiltration testing are presented in the **Exploration and Laboratory Results**

Laboratory Testing

The project engineer reviewed the field data and assigned laboratory tests. The laboratory testing program included the following types of tests:

10. Moisture Content
11. Dry Unit Weight
12. Atterberg Limits
13. Fines Content (Wash over No. 200 Sieve)
14. Unconfined Compression Test

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The laboratory testing program included observation of soil samples by an engineer. Based on the results of our field and laboratory programs, we described and classified the soil samples in general accordance with the Unified Soil Classification System.

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Photography Log



Showing P-4 location and facing the north



Showing B-1 location facing the east

Photography Log



Showing B-2 location and facing the west



Showing IT-1 location facing the west

Site Location and Exploration Plans

Contents:

Site Location
Exploration Plan

Note: All attachments are one page unless noted above.

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Site Location

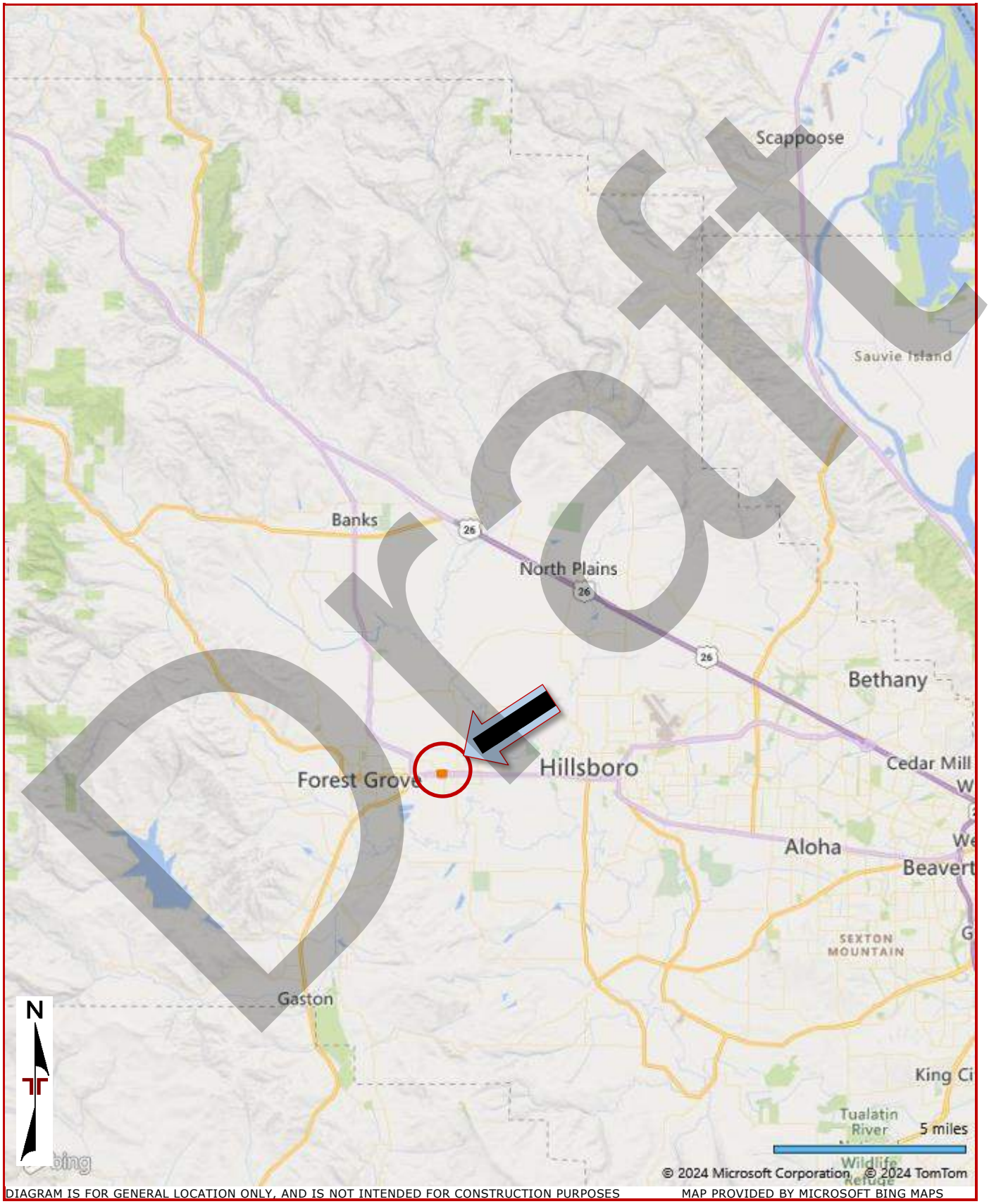


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

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Exploration Plan

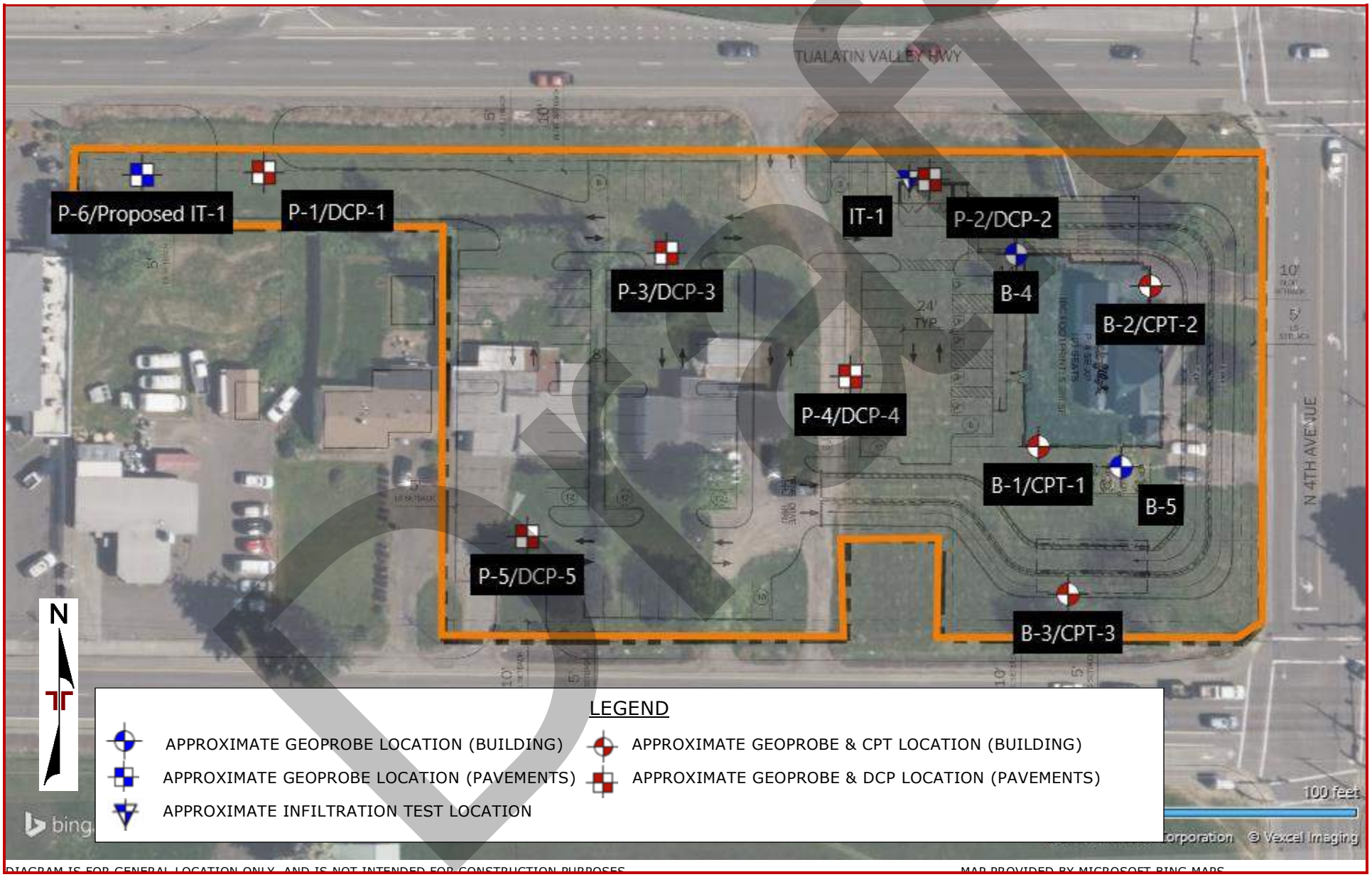


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES. MAP PROVIDED BY MICROSOFT BING MAPS

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Exploration and Laboratory Results

Contents:

Boring Logs (B-1 through B-5, P-1 through P-6)
CPT Logs (CPT-1 through CPT-3)
Dynamic Cone Penetrometer Results (2 pages)
Infiltration Test Results (1 pages)
Atterberg Limits
Fines Content (Wash over No. 200 Sieve)
Unconfined Compressive Strength (2 pages)

Note: All attachments are one page unless noted above.

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Chick- Fil-A Hwy 8 & 4th Avenue FSU 05889
W Baseline Street and N 4th Avenue | Cornelius, OR
Terracon Project No. 82245055

Terracon
700 NE 55th Ave
Portland, OR

Boring Log No. B-1

Location: See Exploration Plan

Latitude: 45.5204° Longitude: -123.0673°

Model Layer	Depth (Ft.)	Elevation: 182 (Ft.) +/-	Water Level Observations	Sample Type	Unconfined Compressive Strength (psf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
1	0.3	**TOPSOIL (OL)**, brown, moist — 181.75				10.0			
		SILT WITH SAND (ML), medium plasticity, brown to light brown, moist				11.9			83
						15.1			
						17.9			
	6.0	176			1550	32.9	80	41-27-14	84
		SILT (ML), trace sand, medium plasticity, gray and brownish yellow, wet				36.6			
						37.5			
			▽			33.9			92
						38.3		44-28-16	
	12.5	169.5				37.6			
			▽			37.4			
2		**SILT WITH SAND (ML)**, nonplastic, gray, wet				36.4			
						37.2			
						35.5		NP	
						30.8			75
						33.2			
						32.6		NP	85
	25.0	157							
		SANDY SILT (ML), nonplastic, gray, wet				39.2		NP	70
						39.5			
	29.0	153							

Depth (Ft.) ticks: 5, 10, 15, 20, 25

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See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Approximate ground surface elevations were estimated using Google Earth

Water Level Observations
▽ While drilling
▽ At completion of drilling

Drill Rig
Geoprobe 6622 GT

Driller
OGE

Logged by
D. Dunn

Boring Started
06-14-2024

Boring Completed
06-14-2024

Notes

Advancement Method
Push Probe

Abandonment Method
Boring backfilled with bentonite chips upon completion.

Chick- Fil-A Hwy 8 & 4th Avenue FSU 05889
W Baseline Street and N 4th Avenue | Cornelius, OR
Terracon Project No. 82245055

Terracon
700 NE 55th Ave
Portland, OR

Boring Log No. B-1

Location: See Exploration Plan

Latitude: 45.5204° Longitude: -123.0673°

Depth (Ft.) Elevation: 182 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Unconfined Compressive Strength (psf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
2		**SILT WITH SAND (ML)**, nonplastic, gray, wet				29.2			
						27.4			
						35.6		NP	82
						36.1			
		36.5 145.5				26.8			
		SILTY SAND (SM), fine grained, gray, wet							
						32.8		NP	48
		40.0 142							
		Boring Terminated at 40 Feet							

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See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

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Water Level Observations
While drilling
At completion of drilling

Drill Rig
Geoprobe 6622 GT

Driller
OGE

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D. Dunn

Boring Started
06-14-2024

Boring Completed
06-14-2024

Notes

Advancement Method
Push Probe

Abandonment Method
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Terracon Project No. 82245055

Terracon
700 NE 55th Ave
Portland, OR

Boring Log No. B-2

Location: See Exploration Plan

Latitude: 45.5207° Longitude: -123.0671°

Depth (Ft.) | Elevation: 181 (Ft.) +/-

Model Layer	Depth (Ft.)	Material Description	Water Level Observations	Sample Type	Unconfined Compressive Strength (psf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
1	0.5	**FILL - POORLY GRADED GRAVEL WITH SILT AND SAND (GP-GM)**, fine to coarse grained, subangular, gray, moist, crushed aggregate							
2		**SILT WITH SAND (ML)**, low plasticity, brown, moist				22.9			
						23.9			
						33.8			
	5					33.6			
		brown and gray				34.7			
		nonplastic, wet	▽			34.4			
						35.1			
	10				1350	31.2	88	NP	76
						40.8			
						37.5			
						37.3			
						37.2			
	15					29.1			
						30.0			
	19.0								
	162	**SILT (ML)**, trace sand, nonplastic, grayish brown, wet							
	20					30.5			94
	25.0								
	156	***Boring Terminated at 25 Feet***							
	25								

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See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Approximate ground surface elevations were estimated using Google Earth

Water Level Observations
▽ At completion of drilling

Drill Rig
Geoprobe 6622 GT

Driller
OGE

Notes

Advancement Method
Push Probe

Logged by
D. Dunn

Abandonment Method
Boring backfilled with bentonite chips upon completion.

Boring Started
06-14-2024

Boring Completed
06-14-2024

Chick- Fil-A Hwy 8 & 4th Avenue FSU 05889
W Baseline Street and N 4th Avenue | Cornelius, OR
Terracon Project No. 82245055

Terracon
700 NE 55th Ave
Portland, OR

Boring Log No. B-3

Location: See Exploration Plan

Latitude: 45.5202° Longitude: -123.0672°

Depth (Ft.) | Elevation: 181 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Unconfined Compressive Strength (psf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
1		0.3 **TOPSOIL (OL)**, dark brown to brownish yellow, dry — 180.75							
2		**SILT WITH SAND (ML)**, low plasticity, brown, moist				6.6			
						20.0			
						19.5			
		5				27.0			
						37.4			
			▽			32.0			
						33.0			
		10							
		wet	▽			34.3			
						36.1			
						34.5			
		15.0 — 166							
		15 ***Boring Terminated at 15 Feet***							

Draft

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Approximate ground surface elevations were estimated using Google Earth

Water Level Observations
▽ While sampling
▽ At completion of drilling

Drill Rig
Geoprobe 6622 GT

Driller
OGE

Logged by
D. Dunn

Boring Started
06-14-2024

Boring Completed
06-14-2024

Notes

Advancement Method
Push Probe

Abandonment Method
Boring backfilled with bentonite chips upon completion.

Chick- Fil-A Hwy 8 & 4th Avenue FSU 05889
W Baseline Street and N 4th Avenue | Cornelius, OR
Terracon Project No. 82245055

Terracon
700 NE 55th Ave
Portland, OR

Boring Log No. B-4

Location: See Exploration Plan

Latitude: 45.5207° Longitude: -123.0673°

Model Layer	Depth (Ft.)	Elevation: 181 (Ft.) +/-	Water Level Observations	Sample Type	Unconfined Compressive Strength (psf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
1	0.3	**TOPSOIL (OL)**, brown, moist, fine rootlets							
	180.75	**SILT WITH SAND (ML)**, low plasticity, brown to light brown, moist				12.0			
						17.9			
						30.0			
						34.7			
	5					35.7			
			▽			37.1			
						38.6			
						34.3			
						34.6			
	10					35.3			
2						34.2			
	15					30.2			
						34.9			
	20					43.2			
						24.0			
	25.0	156							
		Boring Terminated at 25 Feet							

Draft

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Approximate ground surface elevations were estimated using Google Earth

Water Level Observations
▽ While sampling

Drill Rig
Geoprobe 6622 GT

Driller
OGE

Logged by
D. Dunn

Boring Started
06-14-2024

Boring Completed
06-14-2024

Notes

Advancement Method
Push Probe

Abandonment Method
Boring backfilled with bentonite chips upon completion.

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Terracon Project No. 82245055

Terracon
700 NE 55th Ave
Portland, OR

Boring Log No. B-5

Location: See Exploration Plan

Latitude: 45.5204° Longitude: -123.0671°

Model Layer	Depth (Ft.)	Elevation: 181 (Ft.) +/-	Water Level Observations	Sample Type	Unconfined Compressive Strength (psf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
1	0.3	**TOPSOIL (OL)**, light brown, moist — 180.75							
		SILT WITH SAND (ML), low plasticity, brown, moist				13.5			
						19.7			
						23.2			
						33.6			
	5					24.3			
			▽						
	10	nonplastic, wet				38.2		NP	
2						36.5			
	15.0	166							
		SANDY SILT (ML), nonplastic, gray, wet				37.3			
	17.5	163.5							
		SILT WITH SAND (ML), low plasticity, brown to gray, wet							
	20					34.3			
						30.8			
						29.9			
	25.0	156							
	25	***Boring Terminated at 25 Feet***							

Draft

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Approximate ground surface elevations were estimated using Google Earth

Water Level Observations
▽ At completion of drilling

Drill Rig
Geoprobe 6622 GT

Driller
OGE

Logged by
D. Dunn

Boring Started
06-14-2024

Boring Completed
06-14-2024

Notes

Advancement Method
Push Probe

Abandonment Method
Boring backfilled with bentonite chips upon completion.

Chick- Fil-A Hwy 8 & 4th Avenue FSU 05889
W Baseline Street and N 4th Avenue | Cornelius, OR
Terracon Project No. 82245055

Terracon
700 NE 55th Ave
Portland, OR

Boring Log No. P-1

Location: See Exploration Plan

Latitude: 45.5208° Longitude: -123.0687°

Depth (Ft.) Elevation: 179 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Unconfined Compressive Strength (psf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
1		0.3 **TOPSOIL (OL)**, brown, moist, with fine rootlets 178.75				19.4			
2		**SILT WITH SAND (ML)**, medium plasticity, brown, moist				17.4			
		light brown and gray				33.9			84
						35.5		40-29-11	
		5.0 174				37.1			
		Boring Terminated at 5 Feet 5							

Draft

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Approximate ground surface elevations were estimated using Google Earth

Water Level Observations

Drill Rig
Geoprobe 6622 GT

Driller
OGE

Notes

Advancement Method
Push Probe

Abandonment Method
Boring backfilled with bentonite chips upon completion.

Logged by
D. Dunn

Boring Started
06-13-2024

Boring Completed
06-13-2024

Chick- Fil-A Hwy 8 & 4th Avenue FSU 05889
W Baseline Street and N 4th Avenue | Cornelius, OR
Terracon Project No. 82245055

Terracon
700 NE 55th Ave
Portland, OR

Boring Log No. P-2

Location: See Exploration Plan

Latitude: 45.5208° Longitude: -123.0675°

Depth (Ft.) | Elevation: 183 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Unconfined Compressive Strength (psf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
1		0.5 **TOPSOIL (OL)**, with gravel, brown, moist, with fine rootlets 182.5				5.0			
		SILT WITH SAND (ML), medium plasticity, light brown and brownish yellow gray, moist				10.1			
						21.4			
2		dark brown and brownish yellow				22.0			
		10.0 173							
		Boring Terminated at 10 Feet							

Draft

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Approximate ground surface elevations were estimated using Google Earth

Water Level Observations

Drill Rig
Geoprobe 6622 GT

Driller
OGE

Notes

Advancement Method
Push Probe

Abandonment Method
Boring backfilled with bentonite chips upon completion.

Logged by
D. Dunn

Boring Started
06-13-2024

Boring Completed
06-13-2024

Chick- Fil-A Hwy 8 & 4th Avenue FSU 05889
W Baseline Street and N 4th Avenue | Cornelius, OR
Terracon Project No. 82245055

Terracon
700 NE 55th Ave
Portland, OR

Boring Log No. P-3

Location: See Exploration Plan

Latitude: 45.5207° Longitude: -123.0680°

Model Layer	Graphic Log	Depth (Ft.)	Elevation: 180 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Unconfined Compressive Strength (psf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
1		0.3	**FILL - TOPSOIL (OL)**, low plasticity, brown, moist, with fine rootlets 179.75					12.4			
		1.5	**FILL - SILT WITH SAND (ML)**, low plasticity, brown and light brown, moist 178.5					13.2			
2			**SILT WITH SAND (ML)**, low plasticity, gray and light brown, moist					21.3			
								34.7			
		5.0	175	5				32.7			
			Boring Terminated at 5 Feet								

Draft

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Approximate ground surface elevations were estimated using Google Earth

Water Level Observations

Drill Rig
Geoprobe 6622 GT

Driller
OGE

Notes

Advancement Method
Push Probe

Abandonment Method
Boring backfilled with bentonite chips upon completion.

Logged by
D. Dunn

Boring Started
06-13-2024

Boring Completed
06-13-2024

Chick- Fil-A Hwy 8 & 4th Avenue FSU 05889
W Baseline Street and N 4th Avenue | Cornelius, OR
Terracon Project No. 82245055

Terracon
700 NE 55th Ave
Portland, OR

Boring Log No. P-4

Location: See Exploration Plan

Latitude: 45.5205° Longitude: -123.0676°

Model Layer	Graphic Log	Depth (Ft.)	Elevation: 180 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Unconfined Compressive Strength (psf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
1		0.3	**FILL - TOPSOIL (OL)**, low plasticity, brown, moist 179.75					7.5			
		1.5	**FILL - SILTY GRAVEL WITH SAND (GM)**, coarse grained, angular, light brown, moist 178.5					4.9			
2			**SILT WITH SAND (ML)**, low plasticity, light brown, moist					2.0			
								20.8			
								31.4			
		5.0	175	5							
			Boring Terminated at 5 Feet								

Draft

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Approximate ground surface elevations were estimated using Google Earth

Water Level Observations

Drill Rig
Geoprobe 6622 GT

Driller
OGE

Notes

Advancement Method
Push Probe

Abandonment Method
Boring backfilled with bentonite chips upon completion.

Logged by
D. Dunn

Boring Started
06-13-2024

Boring Completed
06-13-2024

Chick- Fil-A Hwy 8 & 4th Avenue FSU 05889
W Baseline Street and N 4th Avenue | Cornelius, OR
Terracon Project No. 82245055

Terracon
700 NE 55th Ave
Portland, OR

Boring Log No. P-5

Location: See Exploration Plan

Latitude: 45.5203° Longitude: -123.0682°

Depth (Ft.) Elevation: 179 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Unconfined Compressive Strength (psf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
1		0.3 **TOPSOIL (OL)**, light brown, moist 178.75				11.1			
2		**LEAN CLAY (CL)**, trace sand, medium plasticity, grayish brown, moist				20.6			91
						31.8		46-27-19	
						35.3			
		5.0 174				35.3			
		Boring Terminated at 5 Feet 5							

Draft

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Approximate ground surface elevations were estimated using Google Earth

Water Level Observations

Drill Rig
Geoprobe 6622 GT

Driller
OGE

Notes

Advancement Method
Push Probe

Abandonment Method
Boring backfilled with bentonite chips upon completion.

Logged by
D. Dunn

Boring Started
06-14-2024

Boring Completed
06-14-2024

Chick- Fil-A Hwy 8 & 4th Avenue FSU 05889
W Baseline Street and N 4th Avenue | Cornelius, OR
Terracon Project No. 82245055

Terracon
700 NE 55th Ave
Portland, OR

Boring Log No. P-6

Location: See Exploration Plan

Latitude: 45.5208° Longitude: -123.0690°

Depth (Ft.) Elevation: 179 (Ft.) +/-

Model Layer	Graphic Log	Depth (Ft.)	Water Level Observations	Sample Type	Unconfined Compressive Strength (psf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI	Percent Fines
1		0.5 **TOPSOIL (OL)**, brown, moist 178.5				24.8			
2		**SILT WITH SAND (ML)**, low plasticity, brown and gray, moist				19.3			
						33.7			
						33.9			
						20.8			
		5				34.6			
						38.1			
						36.3			
						32.2			
						33.6			
		10				33.1			
						38.2			
						36.5			
		15.0 164				34.3			
		Boring Terminated at 15 Feet							

Draft

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Approximate ground surface elevations were estimated using Google Earth

Water Level Observations
While sampling
At completion of drilling

Drill Rig
Geoprobe 6622 GT

Driller
OGE

Logged by
D. Dunn

Boring Started
06-13-2024

Boring Completed
06-13-2024

Notes

Advancement Method
Push Probe

Abandonment Method
Boring backfilled with bentonite chips upon completion.

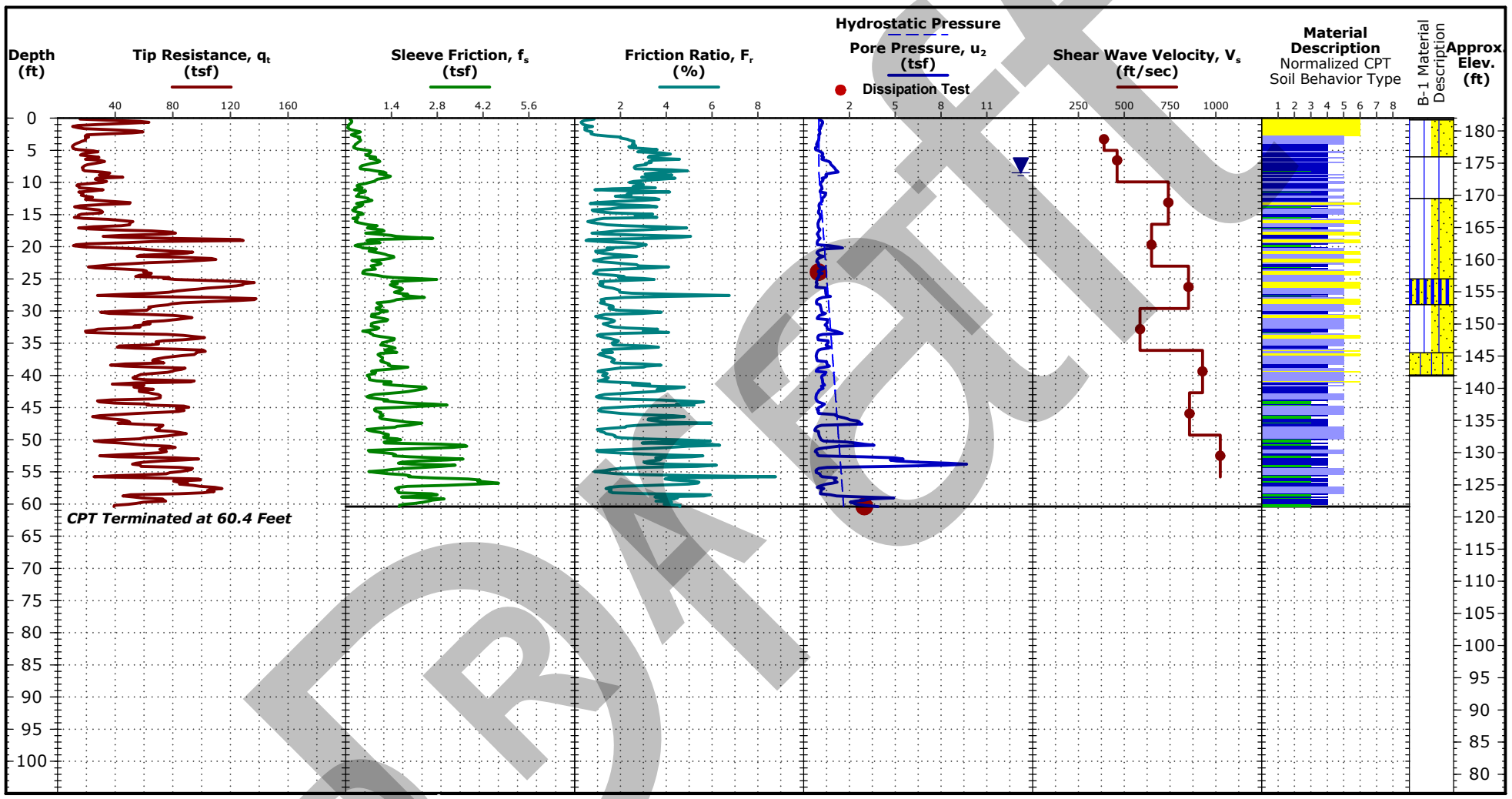
Chick- Fil-A Hwy 8 & 4th Avenue FSU 05889
W Baseline Street and N 4th Avenue | Cornelius, OR
Terracon Project No. 82245055

CPT Sounding ID CPT-1

Terracon
700 NE 55th Ave
Portland, OR

Elevation: 182 (ft) +/-
Elevation Reference: Approximate ground surface elevations were estimated using Google Earth

CPT Started: 6/14/2024
CPT Completed: 6/14/2024



DRAFT

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data, if any.

See Supporting Information for explanation of symbols and abbreviations.

Notes

Test Location: See Exploration Plan

See B-1 for the adjacent test's full details.

CPT Equipment

CPT Rig: DDG1654

Operator: OGE BAK

CPT sensor calibration reports available upon request

Probe No. DDG1654

Water Level Observation

8.5 ft measured water depth

(used in normalizations and correlations)

Normalized Soil Behavior Type
(Robertson 1990)

1 Sensitive, fine grained
2 Organic soils - clay
3 Clay - silty clay to clay
4 Silt mixtures - clayey silt to silty clay
5 Sand mixtures - silty sand to sandy silt
6 Sands - clean sand to silty sand
7 Gravelly sand to dense sand
8 Very stiff sand to clayey sand
9 Very stiff fine grained

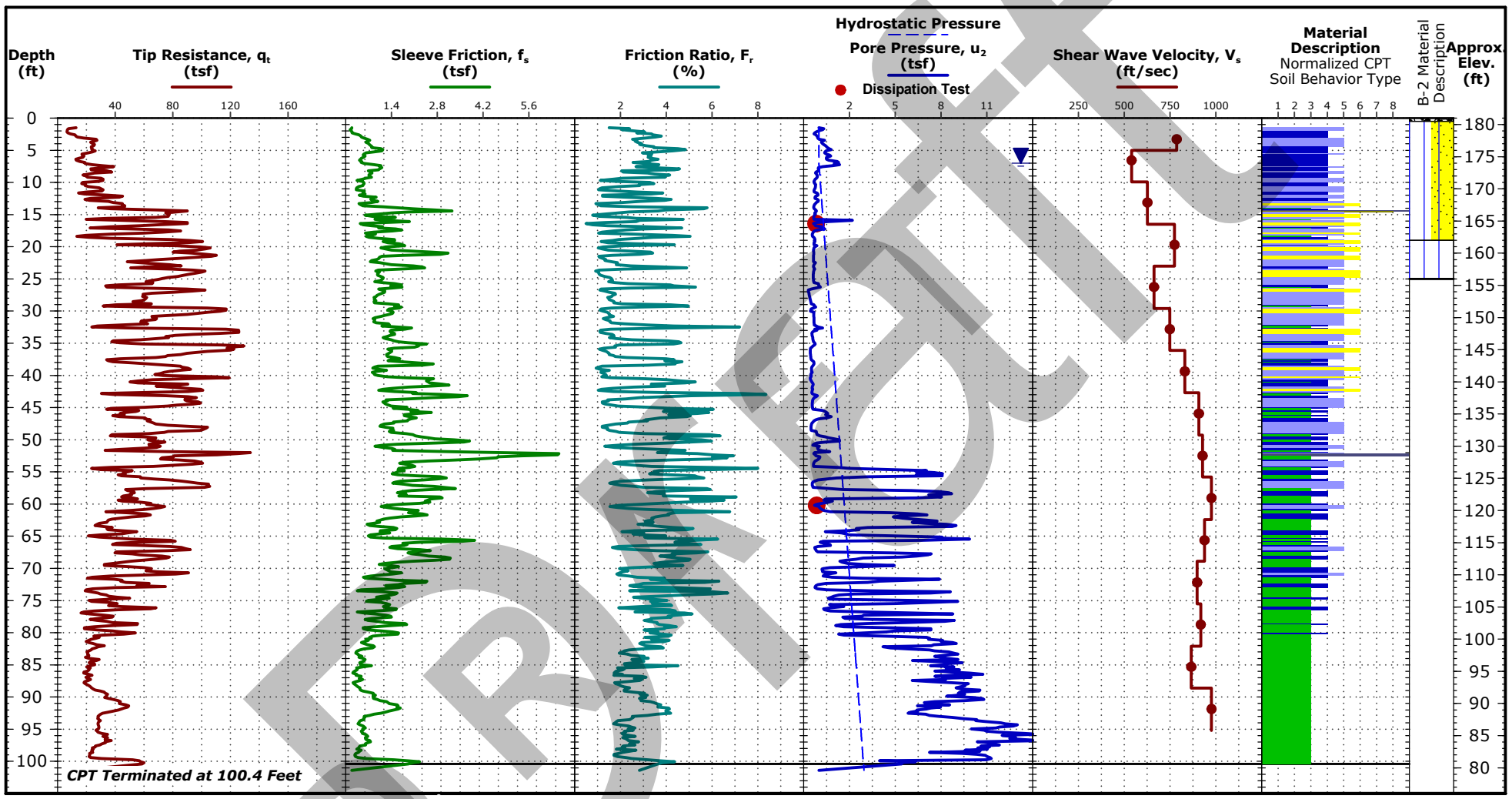
Chick- Fil-A Hwy 8 & 4th Avenue FSU 05889
W Baseline Street and N 4th Avenue | Cornelius, OR
Terracon Project No. 82245055

CPT Sounding ID CPT-2

Terracon
700 NE 55th Ave
Portland, OR

Elevation: 181 (ft) +/-
Elevation Reference: Approximate ground surface elevations were estimated using Google Earth

CPT Started: 6/14/2024
CPT Completed: 6/14/2024



DRAFT

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data, if any.

See Supporting Information for explanation of symbols and abbreviations.

Notes

Test Location: See Exploration Plan

See B-2 for the adjacent test's full details.

CPT Equipment

CPT Rig: DDG1615

Operator: OGE BAK

CPT sensor calibration reports available upon request

Probe No. DDG1615

Water Level Observation

▼ 7 ft measured water depth

(used in normalizations and correlations)

Normalized Soil Behavior Type
(Robertson 1990)

1 Sensitive, fine grained
2 Organic soils - clay
3 Clay - silty clay to clay
4 Silt mixtures - clayey silt to silty clay
5 Sand mixtures - silty sand to sandy silt
6 Sands - clean sand to silty sand
7 Gravelly sand to dense sand
8 Very stiff sand to clayey sand
9 Very stiff fine grained

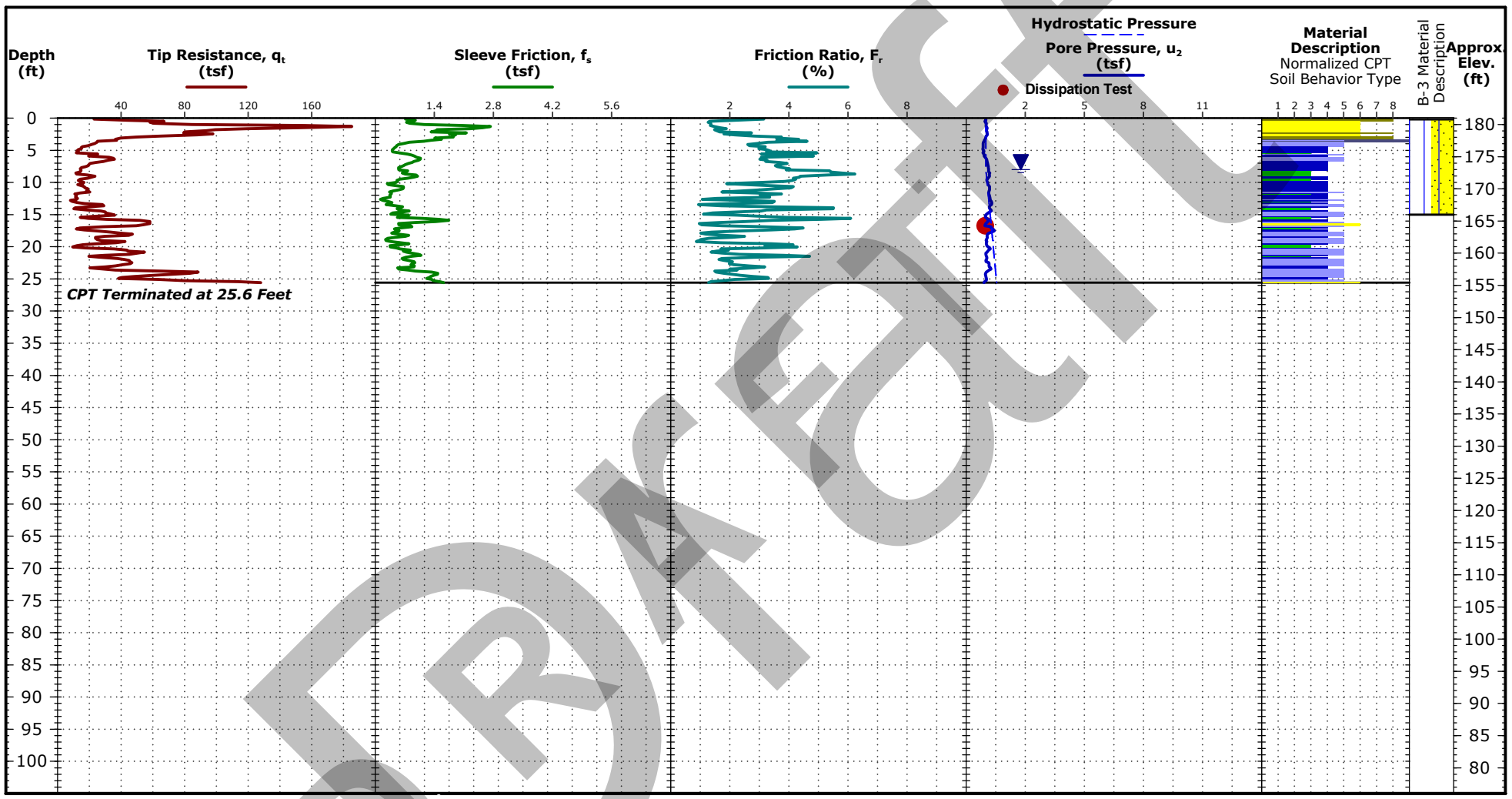
Chick- Fil-A Hwy 8 & 4th Avenue FSU 05889
W Baseline Street and N 4th Avenue | Cornelius, OR
Terracon Project No. 82245055

CPT Sounding ID CPT-3

Terracon
700 NE 55th Ave
Portland, OR

Elevation: 181 (ft) +/-
Elevation Reference: Approximate ground surface elevations were estimated using Google Earth

CPT Started: 6/14/2024
CPT Completed: 6/14/2024



DRAFT

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data, if any.

See Supporting Information for explanation of symbols and abbreviations.

Notes

Test Location: See Exploration Plan

See B-3 for the adjacent test's full details.

CPT Equipment

CPT Rig: DDG1654

Operator: OGE BAK

CPT sensor calibration reports available upon request

Probe No. DDG1654

Water Level Observation

8 ft measured water depth

(used in normalizations and correlations)

Normalized Soil Behavior Type
(Robertson 1990)

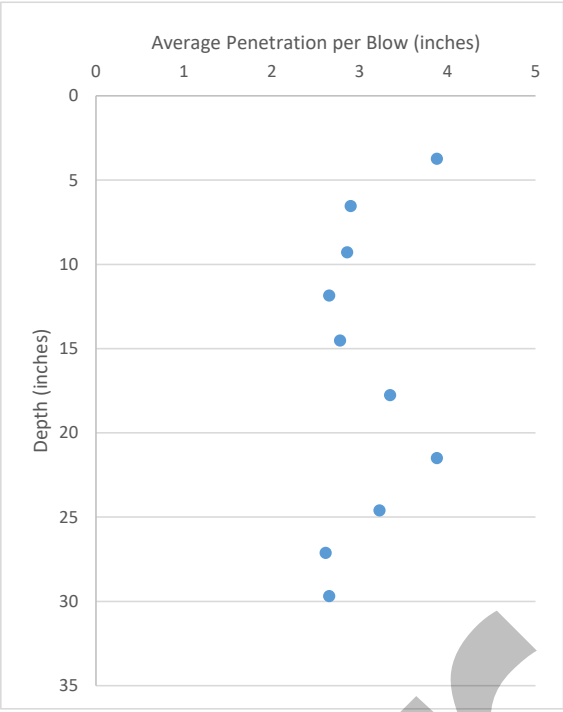
1 Sensitive, fine grained
2 Organic soils - clay
3 Clay - silty clay to clay
4 Silt mixtures - clayey silt to silty clay
5 Sand mixtures - silty sand to sandy silt
6 Sands - clean sand to silty sand
7 Gravelly sand to dense sand
8 Very stiff sand to clayey sand
9 Very stiff fine grained

ARMY CORPS DCP RESULTS

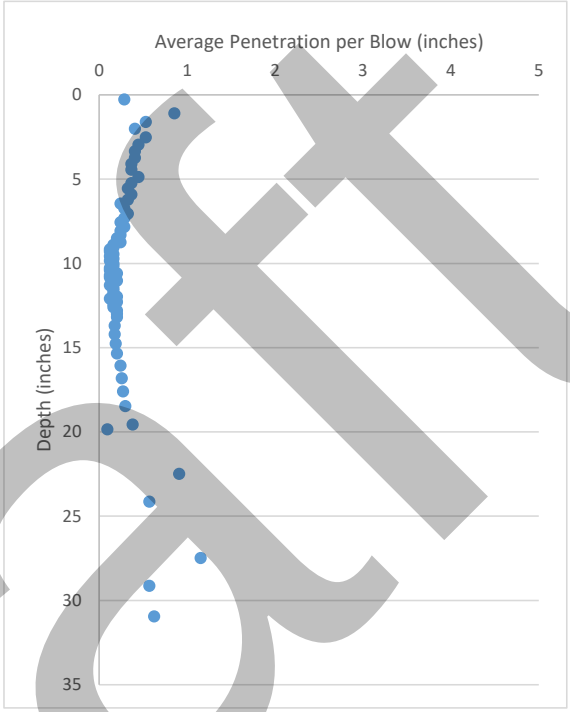
Chick-Fil-A FSU #05889 ■ Cornelius, OR

Field Data Collection: June 14, 2024 ■ Terracon Project No. 82245055

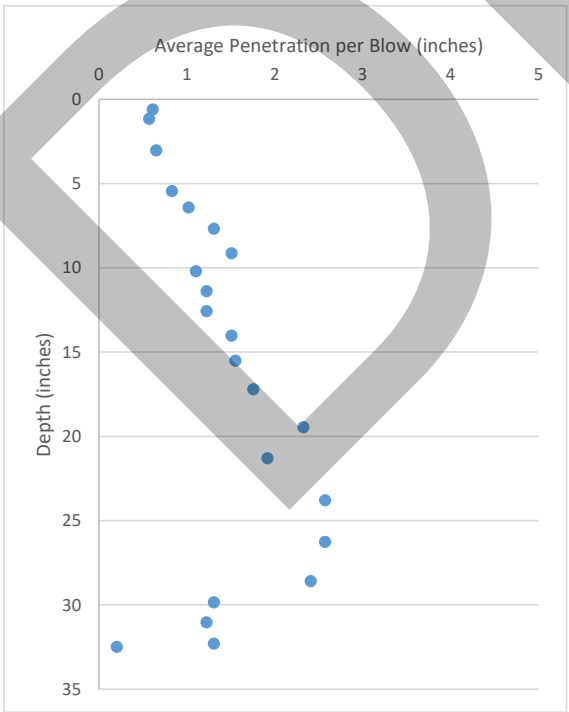
P-01



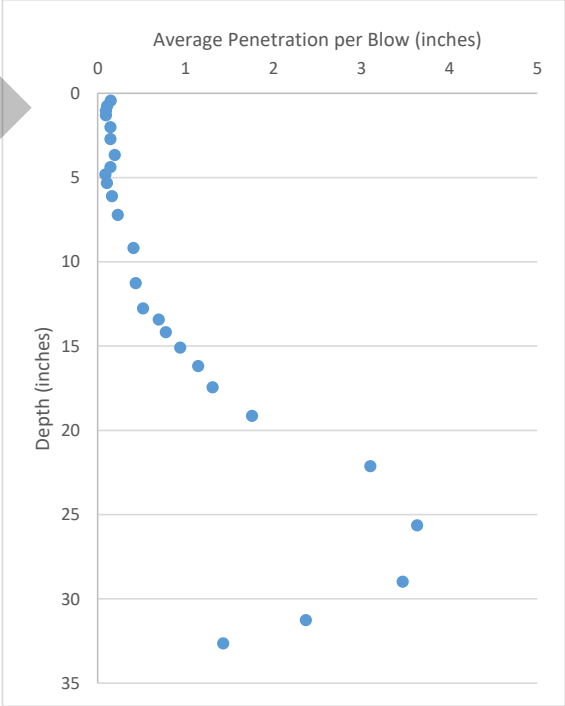
P-02



P-03



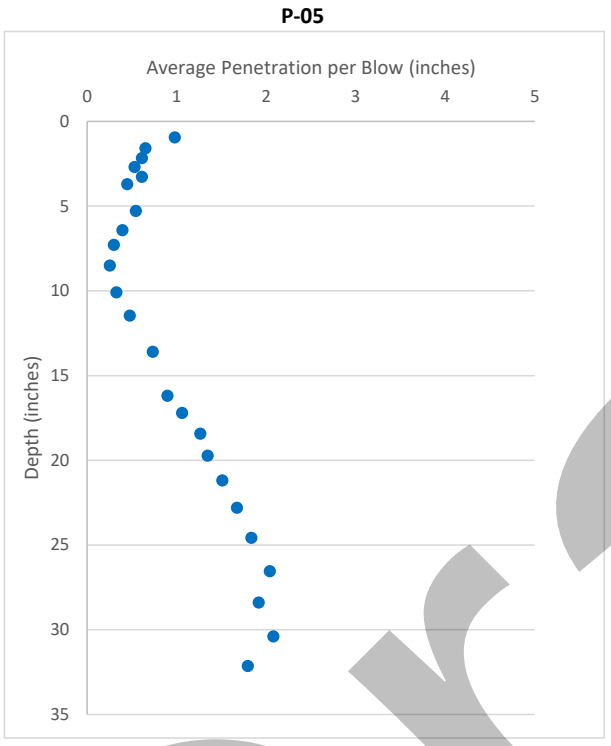
P-04



Draft

ARMY CORPS DCP RESULTS

Chick-Fil-A FSU #05889 ■ Cornelius, OR
Field Data Collection: June 14, 2024 ■ Terracon Project No. 82245055



Draft

Infiltration Testing Results
Chick-Fil-A FSU #05889 | Cornelius, OR
Test Date: June 14, 2024 | Terracon Project No. 82245055

Project	Chick-Fil-A FSU #05889	**Date**	6/14/2024	**Exploration Number**	**IT-1 (Near P-2)**
Test Method	1980 EPA Falling Head				
Inner Diameter of Pipe	6 inches	**Infiltration Test Depth**	**70.5 inches**	**Approximate Elevation**[1]	**175 feet**
Soil at infiltration test depth	Silt with sand				
Presaturation Start Time	10:30 AM	**Presaturation Notes**	Water added periodically to maintain 12 inch head		
Presaturation End Time	2:33 PM				
Head During Presaturation	12 inches				

Time	Time Interval (Minutes)	Measurement[2] (inches)	Drop in Water level (inches)	Infiltration Rate[3] (inches per hour)	Remarks
2:33 PM		64 1/4	---		Water adjusted to provide 6 inch head
2:43 PM	10	64 1/4	0		
2:53 PM	10	64 1/4	0		
3:03 PM	10	64 1/4	0		
3:13 PM	10	64 1/4	0	**0**	
3:23 PM	10	64 1/4	0	**0**	
3:33 PM	10	64 1/4	0	**0**	
3:43 PM	10	64 1/4	0	**0**	
3:53 PM	10	64 1/4	0	**0**	
4:03 PM	10	64 1/4	0	**0**	
4:13 PM	10	64 1/3	1/16	**3/8**	
4:23 PM	10	64 1/3	0	**0**	
4:33 PM	10	64 1/3	0	**0**	

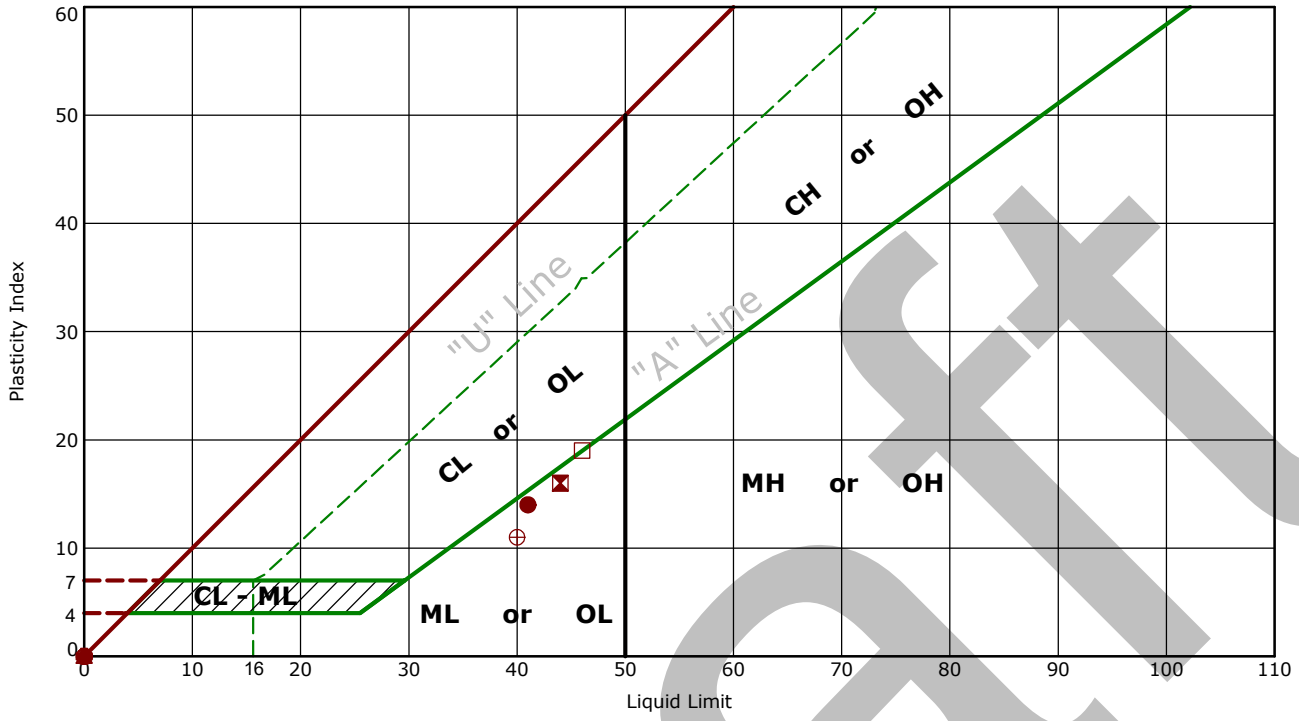
1 Elevation interpolated from Google Earth Pro
2 Measured to nearest 1/16 inch from top of pipe
3 Values calculated are raw (unfactored) rates.

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Terracon
700 NE 55th Ave
Portland, OR

Atterberg Limit Results

ASTM D4318



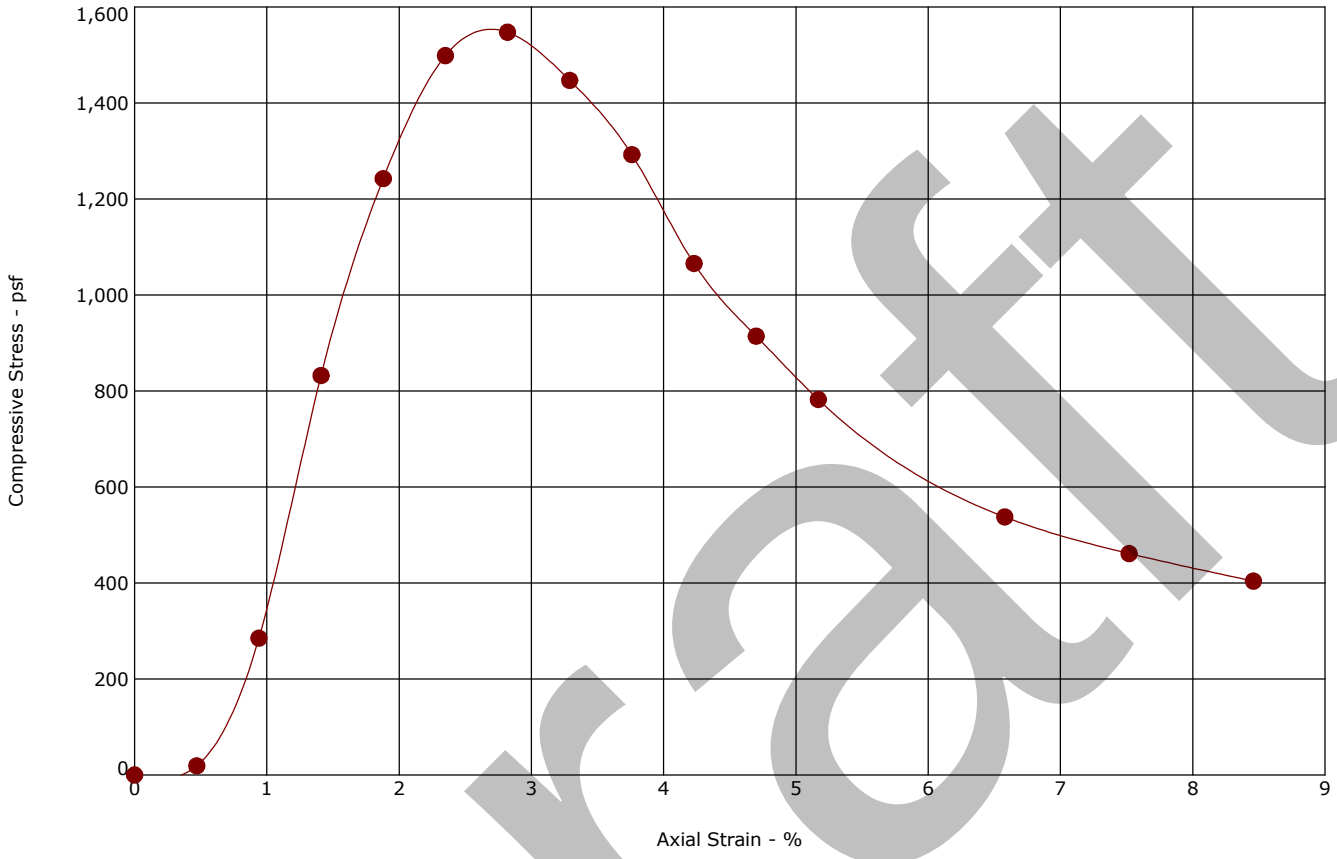
	Boring ID	Depth (Ft)	LL	PL	PI	Fines	USCS	Description
●	B-1	3.5 - 6	41	27	14	83.9	ML	Silt with sand
⊠	B-1	9 - 10	44	28	16		ML	Silt with sand
▲	B-1	15.5 - 16.5	NP	NP	NP		ML	Silt with sand
★	B-1	21.5 - 22.5	NP	NP	NP	84.7	ML	Silt with sand
⊙	B-1	25 - 27	NP	NP	NP	69.6	ML	Sandy silt
✿	B-1	32 - 34	NP	NP	NP	81.6	ML	Silt with sand
○	B-1	38 - 40	NP	NP	NP	47.5	SM	Silty sand
△	B-2	8.5 - 11	NP	NP	NP	75.9	ML	Silt with sand
⊗	B-5	10 - 11.5	NP	NP	NP		ML	Silt with sand
⊕	P-1	3 - 4	40	29	11		ML	Silt with sand
□	P-5	2.5 - 3.5	46	27	19		CL	Lean clay trace sand

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Terracon
700 NE 55th Ave
Portland, OR

Unconfined Compression Test

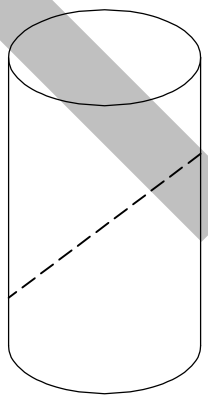
ASTM D2166



Draft

Boring ID	Depth (Ft)	Sample type	LL	PL	PI	Fines (%)	Description
B-1	3.5 - 6	Shelby Tube	41	27	14	83.9	Silt with sand

Specimen Failure Mode



Failure Mode: Shear (dashed)

Specimen Test Data

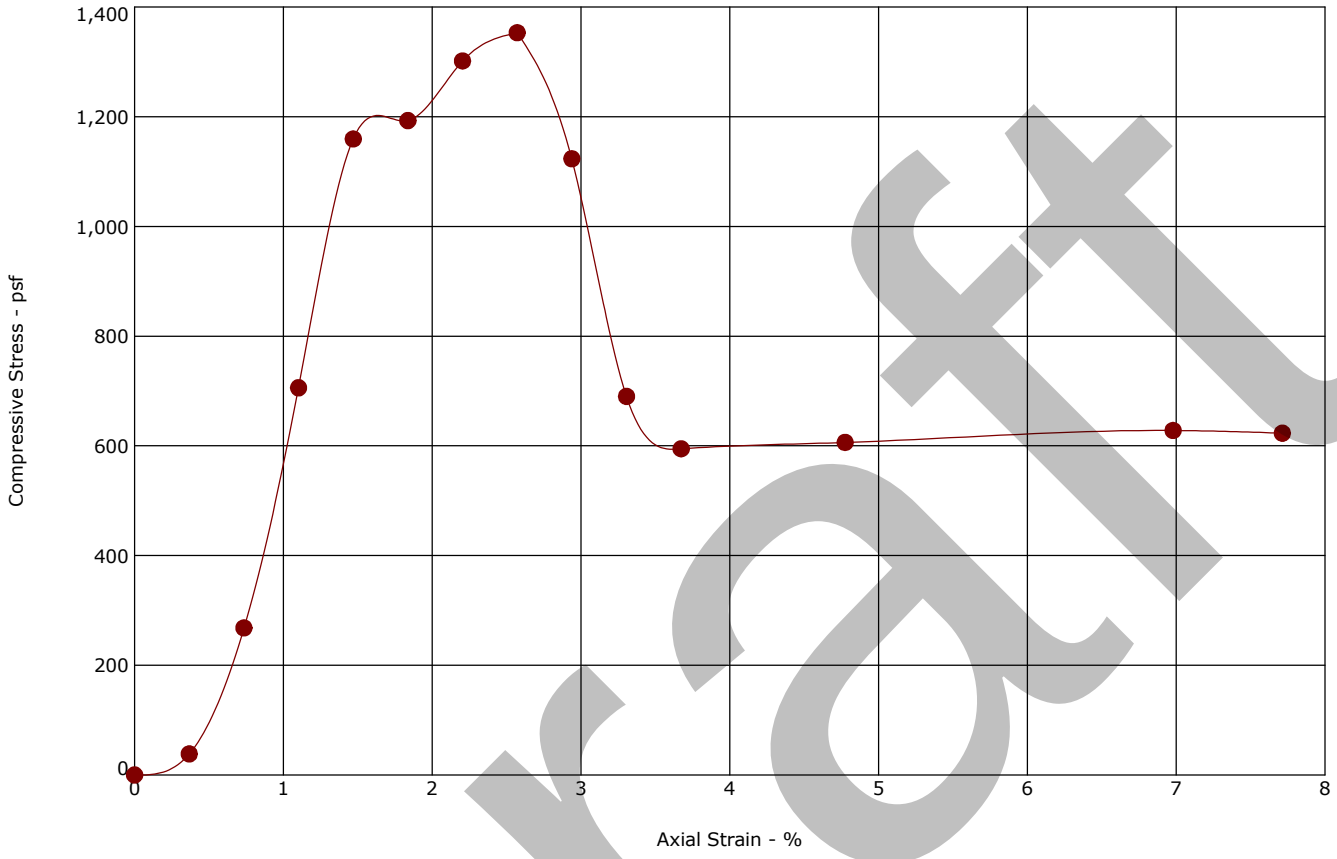
Moisture Content (%):	32.9
Dry Density (pcf):	80
Diameter (in.):	2.87
Height (in.):	4.26
Height / Diameter Ratio:	1.48
Calculated Saturation (%):	78.89
Calculated Void Ratio:	1.15
Assumed Specific Gravity:	2.75
Failure Strain (%):	2.82
Unconfined Compressive Strength (psf):	1547
Undrained Shear Strength (psf):	774
Strain Rate (in/min):	

Remarks: The height to diameter ratio does not comply with ASTM D2166.

Terracon
700 NE 55th Ave
Portland, OR

Unconfined Compression Test

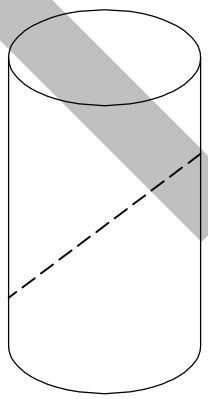
ASTM D2166



Draft

Boring ID	Depth (Ft)	Sample type	LL	PL	PI	Fines (%)	Description
B-2	8.5 - 11	Shelby Tube	NP	NP	NP	75.9	Silt with sand

Specimen Failure Mode



Failure Mode: Shear (dashed)

Specimen Test Data

Moisture Content (%):	31.2
Dry Density (pcf):	88
Diameter (in.):	2.86
Height (in.):	5.44
Height / Diameter Ratio:	1.90
Calculated Saturation (%):	90.11
Calculated Void Ratio:	0.95
Assumed Specific Gravity:	2.75
Failure Strain (%):	2.57
Unconfined Compressive Strength (psf):	1353
Undrained Shear Strength (psf):	677
Strain Rate (in/min):	

Remarks: The height to diameter ratio does not comply with ASTM D2166.

Supporting Information

Contents:

Push Probe General Notes
Cone Penetrometer Test General Notes
Unified Soil Classification System

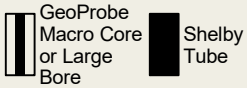
Note: All attachments are one page unless noted above.

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Terracon
700 NE 55th Ave
Portland, OR

General Notes

Sampling



Water Level


Water Initially Encountered


Water Level After a Specified Period of Time


Water Level After a Specified Period of Time


Cave In Encountered

Water levels indicated on the soil boring logs are the levels measured in the borehole at the times indicated. Groundwater level variations will occur over time. In low permeability soils, accurate determination of groundwater levels is not possible with short term water level observations.

Field Tests

N	Standard Penetration Test Resistance (Blows/Ft.)
(HP)	Hand Penetrometer
(T)	Torvane
(DCP)	Dynamic Cone Penetrometer
UC	Unconfined Compressive Strength
(PID)	Photo-Ionization Detector
(OVA)	Organic Vapor Analyzer

Descriptive Soil Classification

Soil classification as noted on the soil boring logs is based Unified Soil Classification System. Where sufficient laboratory data exist to classify the soils consistent with ASTM D2487 "Classification of Soils for Engineering Purposes" this procedure is used. ASTM D2488 "Description and Identification of Soils (Visual-Manual Procedure)" is also used to classify the soils, particularly where insufficient laboratory data exist to classify the soils in accordance with ASTM D2487. In addition to USCS classification, coarse grained soils are classified on the basis of their in-place relative density, and fine-grained soils are classified on the basis of their consistency. See "Strength Terms" table below for details. The ASTM standards noted above are for reference to methodology in general. In some cases, variations to methods are applied as a result of local practice or professional judgment.

Location And Elevation Notes

Exploration point locations as shown on the Exploration Plan and as noted on the soil boring logs in the form of Latitude and Longitude are approximate. See Exploration and Testing Procedures in the report for the methods used to locate the exploration points for this project. Surface elevation data annotated with +/- indicates that no actual topographical survey was conducted to confirm the surface elevation. Instead, the surface elevation was approximately determined from topographic maps of the area.

Strength Terms

Relative Density of Coarse-Grained Soils
(More than 50% retained on No. 200 sieve.)
Density determined by Standard Penetration Resistance

Relative Density	Standard Penetration or N-Value (Blows/Ft.)
Very Loose	0 - 3
Loose	4 - 9
Medium Dense	10 - 29
Dense	30 - 50
Very Dense	> 50

Consistency of Fine-Grained Soils
(50% or more passing the No. 200 sieve.)
Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance

Consistency	Unconfined Compressive Strength Qu (psf)	Standard Penetration or N-Value (Blows/Ft.)
Very Soft	less than 500	0 - 1
Soft	500 to 1,000	2 - 4
Medium Stiff	1,000 to 2,000	4 - 8
Stiff	2,000 to 4,000	8 - 15
Very Stiff	4,000 to 8,000	15 - 30
Hard	> 8,000	> 30

Relevance of Exploration and Laboratory Test Results

Exploration/field results and/or laboratory test data contained within this document are intended for application to the project as described in this document. Use of such exploration/field results and/or laboratory test data should not be used independently of this document.

Draft

CPT GENERAL NOTES

DESCRIPTION OF MEASUREMENTS AND CALIBRATIONS

To be reported per ASTM D5778:

Uncorrected Tip Resistance, q_c
Measured force acting on the cone divided by the cone's projected area

Corrected Tip Resistance, q_t
Cone resistance corrected for porewater and net area ratio effects
$q_t = q_c + u_2(1 - a)$

Where a is the net area ratio, a lab calibration of the cone typically between 0.70 and 0.85

Pore Pressure, u
Pore pressure measured during penetration
u_1 - sensor on the face of the cone
u_2 - sensor on the shoulder (more common)

Sleeve Friction, f_s
Frictional force acting on the sleeve divided by its surface area

Normalized Friction Ratio, F_r
The ratio as a percentage of f_s to q_t, accounting for overburden pressure

To be reported per ASTM D7400, if collected:

Shear Wave Velocity, V_s
Measured in a Seismic CPT and provides direct measure of soil stiffness

DESCRIPTION OF GEOTECHNICAL CORRELATIONS

Normalized Tip Resistance, Q_{tn}
$Q_{tn} = ((q_t - \sigma_{v0})/P_a)(P_a/\sigma'_{v0})^n$
$n = 0.381(I_c) + 0.05(\sigma'_{v0}/P_a) - 0.15$

Over Consolidation Ratio, OCR
$OCR\ (1) = 0.25(Q_{tn})^{1.25}$
$OCR\ (2) = 0.33(Q_{tn})$

Undrained Shear Strength, S_u
$S_u = Q_{tn} \times \sigma'_{v0}/N_{kt}$
N_{kt} is a soil-specific factor (shown on S_u plot)

Sensitivity, S_t
$S_t = (q_t - \sigma_{v0}/N_{kt}) \times (1/f_s)$

Effective Friction Angle, ϕ'
$\phi'\ (1) = \tan^{-1}(0.373[\log(q_c/\sigma'_{v0}) + 0.29])$
$\phi'\ (2) = 17.6 + 11[\log(Q_{tn})]$

Unit Weight, γ
$\gamma = (0.27[\log(F_r)]+0.36[\log(q_t/atm)]+1.236) \times \gamma_{water}$
σ_{v0} is taken as the incremental sum of the unit weights

Small Strain Shear Modulus, G_0
$G_0\ (1) = \rho V_s^2$
$G_0\ (2) = 0.015 \times 10^{(0.55Ic + 1.68)}(q_t - \sigma_{v0})$

Soil Behavior Type Index, I_c
$I_c = [(3.47 - \log(Q_{tn}))^2 + (\log(F_r) + 1.22)^2]^{0.5}$

SPT N_{60}
$N_{60} = (q_t/atm) / 10^{(1.1268 - 0.2817Ic)}$

Elastic Modulus, E_s (assumes $q/q_{ultimate} \sim 0.3$, i.e. FS = 3)
$E_s\ (1) = 2.6\Psi G_0$ where $\Psi = 0.56 - 0.33\log Q_{tn,clean\ sand}$
$E_s\ (2) = G_0$
$E_s\ (3) = 0.015 \times 10^{(0.55Ic + 1.68)}(q_t - \sigma_{v0})$
$E_s\ (4) = 2.5q_t$

Constrained Modulus, M
$M = \alpha_M(q_t - \sigma_{v0})$
For $I_c > 2.2$ (fine-grained soils)
$\alpha_M = Q_{tn}$ with maximum of 14
For $I_c < 2.2$ (coarse-grained soils)
$\alpha_M = 0.0188 \times 10^{(0.55Ic + 1.68)}$

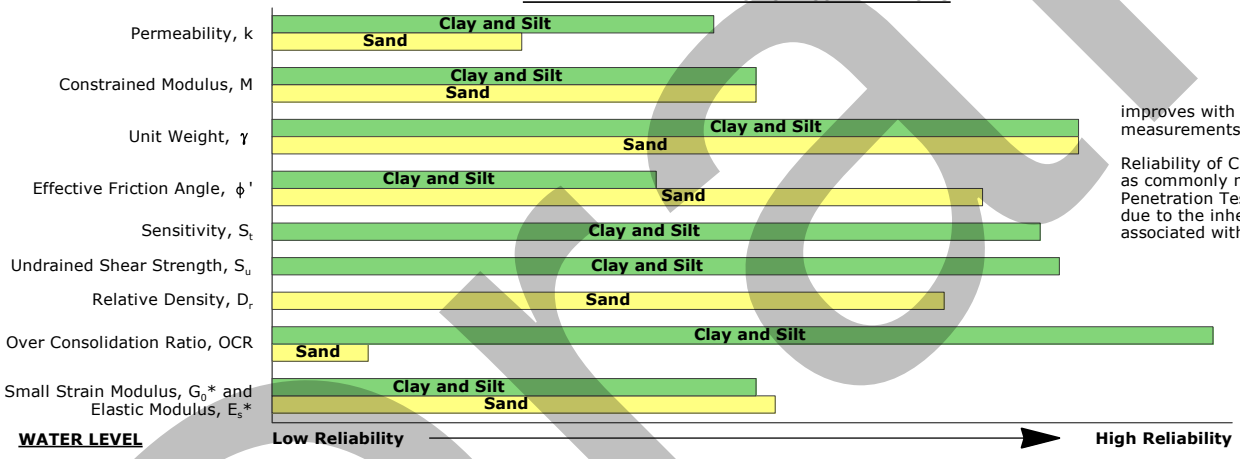
Hydraulic Conductivity, k
For $1.0 < I_c < 3.27$ $k = 10^{(0.952 - 3.04Ic)}$
For $3.27 < I_c < 4.0$ $k = 10^{(-4.52 - 1.37Ic)}$

Relative Density, D_r
$D_r = (Q_{tn} / 350)^{0.5} \times 100$

REPORTED PARAMETERS

CPT logs as provided, at a minimum, report the data as required by ASTM D5778 and ASTM D7400 (if applicable). This minimum data include q_t, f_s, and u. Other correlated parameters may also be provided. These other correlated parameters are interpretations of the measured data based upon published and reliable references, but they do not necessarily represent the actual values that would be derived from direct testing to determine the various parameters. To this end, more than one correlation to a given parameter may be provided. The following chart illustrates estimates of reliability associated with correlated parameters based upon the literature referenced below.

RELATIVE RELIABILITY OF CPT CORRELATIONS



improves with seismic V_s measurements

Reliability of CPT-predicted N_{60} values as commonly measured by the Standard Penetration Test (SPT) is not provided due to the inherent inaccuracy associated with the SPT test procedure.

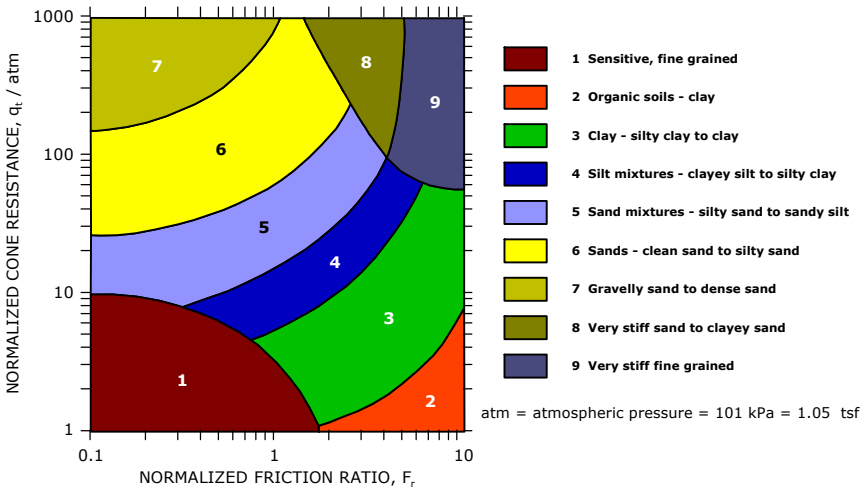
WATER LEVEL

The groundwater level at the CPT location is used to normalize the measurements for vertical overburden pressures and as a result influences the normalized soil behavior type classification and correlated soil parameters. The water level may either be "measured" or "estimated:"
Measured - Depth to water directly measured in the field
Estimated - Depth to water interpolated by the practitioner using pore pressure measurements in coarse grained soils and known site conditions
While groundwater levels displayed as "measured" more accurately represent site conditions at the time of testing than those "estimated," in either case the groundwater should be further defined prior to construction as groundwater level variations will occur over time.

CONE PENETRATION SOIL BEHAVIOR TYPE

The estimated stratigraphic profiles included in the CPT logs are based on relationships between corrected tip resistance (q_t), friction resistance (f_s), and porewater pressure (u_2). The normalized friction ratio (F_r) is used to classify the soil behavior type.

Typically, silts and clays have high F_r values and generate large excess penetration porewater pressures; sands have lower F_r's and do not generate excess penetration porewater pressures. The adjacent graph (Robertson *et al.*) presents the soil behavior type correlation used for the logs. This normalized SBT chart, generally considered the most reliable, does not use pore pressure to determine SBT due to its lack of repeatability in onshore CPTs.



atm = atmospheric pressure = 101 kPa = 1.05 tsf

REFERENCES

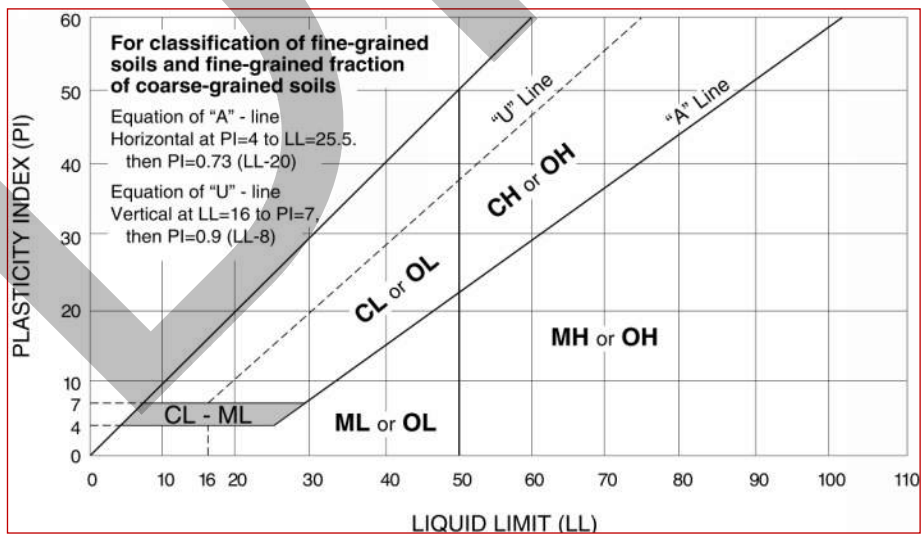
Kulhawy, F.H., Mayne, P.W., (1997). "Manual on Estimating Soil Properties for Foundation Design," Electric Power Research Institute, Palo Alto, CA.
Mayne, P.W., (2013). "Geotechnical Site Exploration in the Year 2013," Georgia Institue of Technology, Atlanta, GA.
Robertson, P.K., Cabal, K.L. (2012). "Guide to Cone Penetration Testing for Geotechnical Engineering," Signal Hill, CA.
Schmertmann, J.H., (1970). "Static Cone to Compute Static Settlement over Sand,"*Journal of the Soil Mechanics and Foundations Division*,96(SM3), 1011-1043.

Draft

Unified Soil Classification System

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests [A]				Soil Classification	
				Group Symbol	Group Name [B]
Coarse-Grained Soils: More than 50% retained on No. 200 sieve	**Gravels:** More than 50% of coarse fraction retained on No. 4 sieve	**Clean Gravels:** Less than 5% fines [C]	Cu≥4 and 1≤Cc≤3 [E]	GW	Well-graded gravel [F]
			Cu<4 and/or [Cc<1 or Cc>3.0] [E]	GP	Poorly graded gravel [F]
		Gravels with Fines: More than 12% fines [C]	Fines classify as ML or MH	GM	Silty gravel [F, G, H]
			Fines classify as CL or CH	GC	Clayey gravel [F, G, H]
	Sands: 50% or more of coarse fraction passes No. 4 sieve	**Clean Sands:** Less than 5% fines [D]	Cu≥6 and 1≤Cc≤3 [E]	SW	Well-graded sand [I]
			Cu<6 and/or [Cc<1 or Cc>3.0] [E]	SP	Poorly graded sand [I]
		Sands with Fines: More than 12% fines [D]	Fines classify as ML or MH	SM	Silty sand [G, H, I]
			Fines classify as CL or CH	SC	Clayey sand [G, H, I]
Fine-Grained Soils: 50% or more passes the No. 200 sieve	**Silts and Clays:** Liquid limit less than 50	**Inorganic:**	PI > 7 and plots above "A" line [J]	CL	Lean clay [K, L, M]
			PI < 4 or plots below "A" line [J]	ML	Silt [K, L, M]
		Organic:	$\frac{LL\ oven\ dried}{LL\ not\ dried} < 0.75$	OL	Organic clay [K, L, M, N]
					Organic silt [K, L, M, O]
	Silts and Clays: Liquid limit 50 or more	**Inorganic:**	PI plots on or above "A" line	CH	Fat clay [K, L, M]
			PI plots below "A" line	MH	Elastic silt [K, L, M]
		Organic:	$\frac{LL\ oven\ dried}{LL\ not\ dried} < 0.75$	OH	Organic clay [K, L, M, P]
					Organic silt [K, L, M, Q]
Highly organic soils:	Primarily organic matter, dark in color, and organic odor			PT	Peat

[A] Based on the material passing the 3-inch (75-mm) sieve.
[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.
[C] Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.
[D] Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay.
[E] $Cu = D_{60}/D_{10}$ $Cc = \frac{(D_{30})^2}{D_{10} \times D_{60}}$
[F] If soil contains ≥ 15% sand, add "with sand" to group name.
[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.
[H] If fines are organic, add "with organic fines" to group name.
[I] If soil contains ≥ 15% gravel, add "with gravel" to group name.
[J] If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.
[K] If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.
[L] If soil contains ≥ 30% plus No. 200 predominantly sand, add "sandy" to group name.
[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.
[N] PI ≥ 4 and plots on or above "A" line.
[O] PI < 4 or plots below "A" line.
[P] PI plots on or above "A" line.
[Q] PI plots below "A" line.



DRAFT

KITTELSON & ASSOCIATES
851 SW 6th Avenue, Suite 600
Portland, OR 97204
P 503.228.5230

Memorandum

September 25, 2024

Project#: 30770



To: John Russell, PE, Tony Rikli, PE, & Marah Danielson
Oregon Department of Transportation (ODOT) Region 1
123 NW Flanders Street
Portland, OR 97209

Terry Keyes, PE
City of Cornelius
1300 S Kodiak Circle
Cornelius, OR 97113

CC: Steve Schwartz, Chick-fil-A, Inc.
Andrew Hunt & Austin Cross, 4G Development & Consulting, Inc.

From: Chris Brehmer, PE, Julia Kuhn, PE, Cameron Bennett, & Megan Mannion

RE: Cornelius Chick-fil-A Transportation Impact Study

Chick-fil-A (the Applicant) is proposing construction of a new approximately 4,855 square foot restaurant on property located at 47 N 4th Avenue in Cornelius. This report documents the transportation impacts associated with the proposed restaurant. No off-site capacity mitigation measures were identified to support the proposed restaurant.

Subject to applicable City of Cornelius and ODOT concurrence, we recommend Chick-fil-A do the following in conjunction with the proposed restaurant:

- Reconstruct the site frontages along N Adair Street, N 4th Avenue, and W Baseline Street as determined through frontage improvement coordination with ODOT and City staff and consideration of the City's design and construction standards.
- Place new STOP (R1-1) signs for vehicles exiting the site at the new site access driveways onto N Adair Street and W Baseline Street in accordance with City and ODOT standards and the *Manual on Uniform Traffic Control Devices* (MUTCD).
- Place and maintain all vegetation and other above ground objects adjacent to the site access points to provide adequate minimum sight distance in accordance with the applicable City and ODOT requirements.

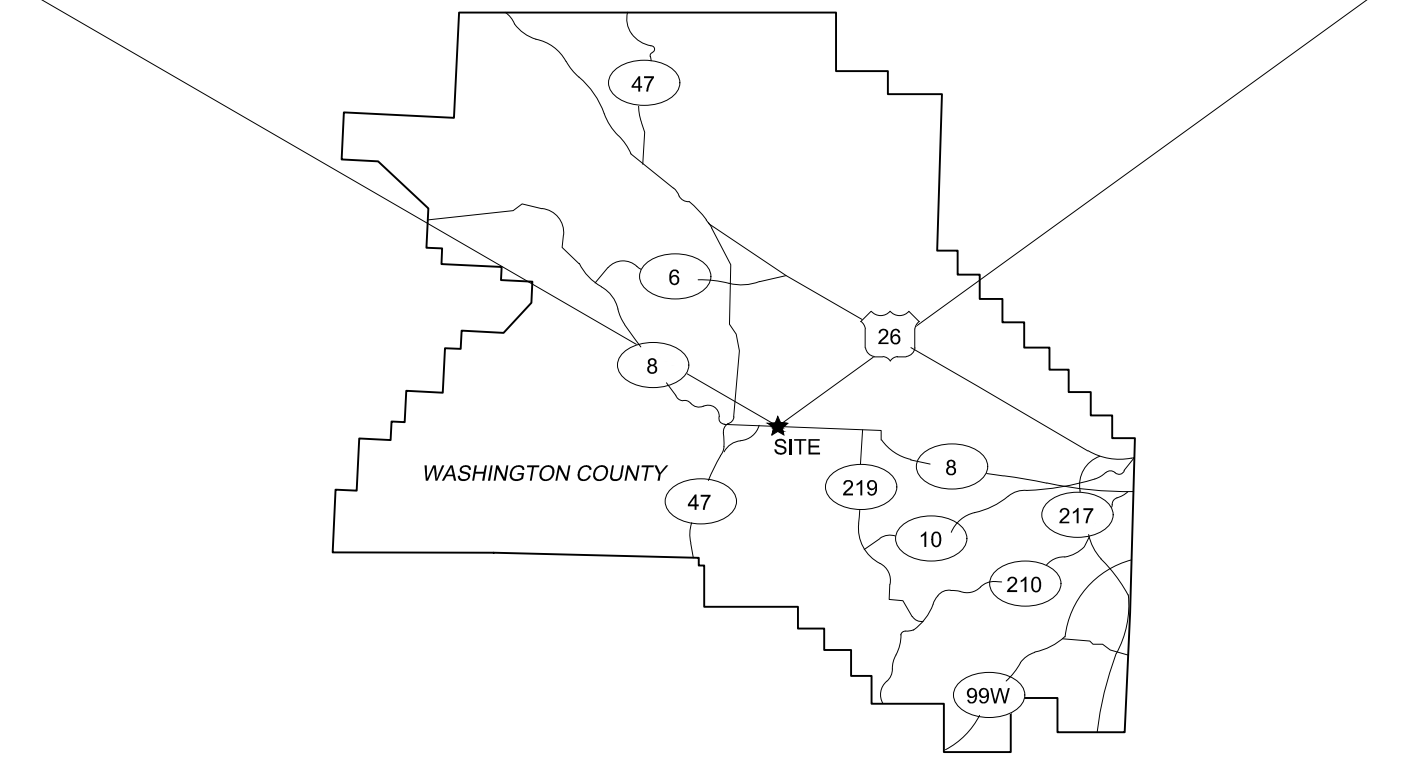
Additional details regarding our study methodology, findings and recommendations are documented herein.

Introduction

The proposed approximately 4,855 square foot Chick-fil-A will replace three existing homes between N Adair Street and W Baseline Street west of N 4th Avenue. The proposed Chick-fil-A will have two drive through lanes located along the east side of the building and will have 70 seats available for dine-in customers. The site is proposed to have one left in/left out access on N Adair Street and one left in/left out access on W Baseline Street. Restaurant development and occupancy is anticipated in 2026.

Figure 1 displays the site vicinity, and Figure 2 displays the proposed site plan.





(##) - Study Intersections

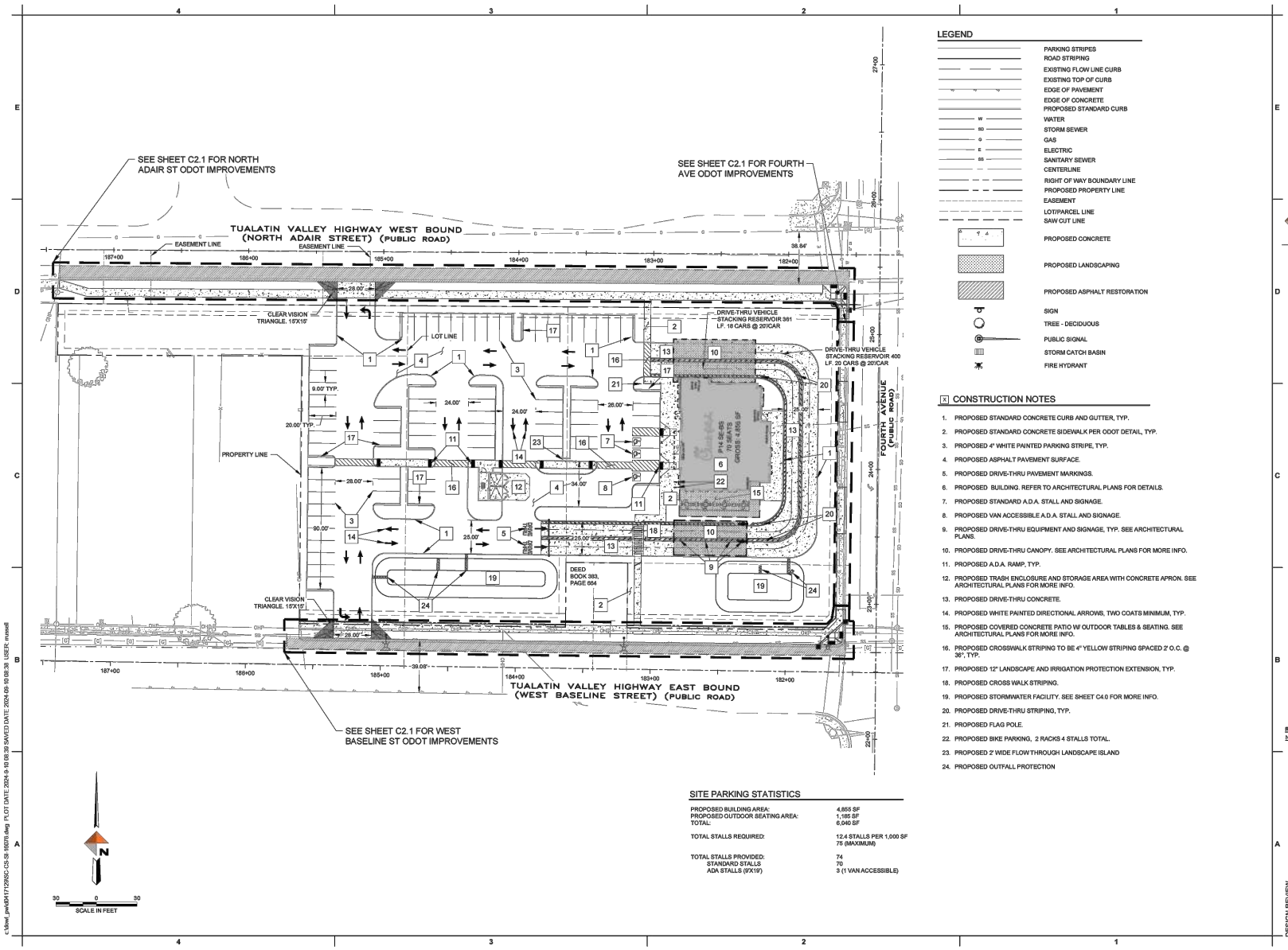
(##) - Proposed Driveway

Site Vicinity Map
Cornelius, OR

Figure
1

H:\30\30770 - Cornelius Chick-fil-A\002 - Traffic Impact Study\report\figs\30770 - Report Figures.dwg Sep 16, 2024 - 1:36pm - cbennett Layout Tab: 1 - Site Vicinity Map

KITTELSON & ASSOCIATES



LEGEND

- PARKING STRIPES
- ROAD STRIPING
- EXISTING FLOW LINE CURB
- EXISTING TOP OF CURB
- EDGE OF PAVEMENT
- EDGE OF CONCRETE
- PROPOSED STANDARD CURB
- W — WATER
- SD — STORM SEWER
- G — GAS
- E — ELECTRIC
- SS — SANITARY SEWER
- CENTERLINE
- RIGHT OF WAY BOUNDARY LINE
- PROPOSED PROPERTY LINE
- EASEMENT
- LOT/PARCEL LINE
- SAW CUT LINE
- PROPOSED CONCRETE
- PROPOSED LANDSCAPING
- PROPOSED ASPHALT RESTORATION
- SIGN
- TREE - DECIDUOUS
- PUBLIC SIGNAL
- STORM CATCH BASIN
- FIRE HYDRANT

CONSTRUCTION NOTES

1. PROPOSED STANDARD CONCRETE CURB AND GUTTER, TYP.
2. PROPOSED STANDARD CONCRETE SIDEWALK PER ODOT DETAIL, TYP.
3. PROPOSED 4" WHITE PAINTED PARKING STRIPE, TYP.
4. PROPOSED ASPHALT PAVEMENT SURFACE.
5. PROPOSED DRIVE-THRU PAVEMENT MARKINGS.
6. PROPOSED BUILDING. REFER TO ARCHITECTURAL PLANS FOR DETAILS.
7. PROPOSED STANDARD A.D.A. STALL AND SIGNAGE.
8. PROPOSED VAN ACCESSIBLE A.D.A. STALL AND SIGNAGE.
9. PROPOSED DRIVE-THRU EQUIPMENT AND SIGNAGE, TYP. SEE ARCHITECTURAL PLANS.
10. PROPOSED DRIVE-THRU CANOPY. SEE ARCHITECTURAL PLANS FOR MORE INFO.
11. PROPOSED A.D.A. RAMP, TYP.
12. PROPOSED TRASH ENCLOSURE AND STORAGE AREA WITH CONCRETE APRON. SEE ARCHITECTURAL PLANS FOR MORE INFO.
13. PROPOSED DRIVE-THRU CONCRETE.
14. PROPOSED WHITE PAINTED DIRECTIONAL ARROWS, TWO COATS MINIMUM, TYP.
15. PROPOSED COVERED CONCRETE PATIO W/ OUTDOOR TABLES & SEATING. SEE ARCHITECTURAL PLANS FOR MORE INFO.
16. PROPOSED CROSSWALK STRIPING TO BE 4" YELLOW STRIPING SPACED 2' O.C. @ 36°, TYP.
17. PROPOSED 12" LANDSCAPE AND IRRIGATION PROTECTION EXTENSION, TYP.
18. PROPOSED CROSS WALK STRIPING.
19. PROPOSED STORMWATER FACILITY. SEE SHEET C4.0 FOR MORE INFO.
20. PROPOSED DRIVE-THRU STRIPING, TYP.
21. PROPOSED FLAG POLE.
22. PROPOSED BIKE PARKING, 2 RACKS 4 STALLS TOTAL.
23. PROPOSED 2' WIDE FLOW THROUGH LANDSCAPE ISLAND
24. PROPOSED OUTFALL PROTECTION

SITE PARKING STATISTICS

PROPOSED BUILDING AREA:	4,855 SF
PROPOSED OUTDOOR SEATING AREA:	1,185 SF
TOTAL:	6,040 SF
TOTAL STALLS REQUIRED:	12.4 STALLS PER 1,000 SF 75 (MAXIMUM)
TOTAL STALLS PROVIDED:	74
STANDARD STALLS	70
ADA STALLS (9'X19')	3 (1 VAN ACCESSIBLE)

Chick-fil-A
5200 Buffington Road
Atlanta, Georgia
30349-2998

DOWL
WWW.DOWL.COM
309 SW 6TH AVENUE, #700
Portland, Oregon 97204
971-280-8641

REGISTERED PROFESSIONAL ENGINEER — OREGON — EXPIRATION DATE: 06/30/26

CHICK-FIL-A
HWY 8 & 4TH AVE
CORNELIUS, OREGON

FSR# 05889

REVISION SCHEDULE

NO.	DATE	DESCRIPTION

CIVIL'S PROJECT #: 1907B.01
PRINTED FOR: SCHEMATIC DESIGN
DATE: JUNE 2024
DRAWN BY: CJG

Information contained on this drawing exists of digital files produced for above named project, may not be reproduced in any manner without express written or verbal consent from authorized subject representative.

SHEET: SITE PLAN
SHEET NUMBER: C2.0
DESIGN REVIEW

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H:\30\30770 - Cornelius Chick-fil-A\002 - Traffic Impact Study\report\figs\30770 - Report Figures.dwg Sep 24, 2024 - 10:25am - cbennett Layout Tab: 2 - Proposed Site Plan

RECEIVED FROM DOWL ON 09/17/2024

KITTELSON & ASSOCIATES

Proposed Site Plan
Cornelius, OR

Figure
2

Report Scope

This report identifies the transportation-related impacts associated with the proposed Chick-fil-A restaurant and was prepared in accordance with scoping direction provided by City and ODOT staff. Intersection operational analyses were performed at the following study intersections during the weekday morning (7-9 AM) and evening (4-6 PM) peak periods:

1. N Adair Street and N 4th Avenue;
2. W Baseline Street and N/S 4th Avenue;

A. N Adair Street and Proposed Site Access A; and,

B. W Baseline Street and Proposed Site Access B.

This report evaluates the following transportation issues:

- Existing land use and transportation system conditions within the site vicinity during the weekday morning and evening peak periods;
- Forecast year 2026 background traffic conditions during the weekday morning and evening peak periods, considering a growth in existing traffic volumes and transportation improvements planned in the study area;
- Trip generation and distribution estimates for the proposed restaurant;
- Forecast year 2026 total traffic conditions during the weekday morning and evening peak periods with build-out of the site;
- Turn lane and queuing considerations;
- Sight distance considerations;
- Delivery truck circulation;
- Compliance with ODOT access spacing requirements per the *Oregon Highway Plan* Appendix C;
- Drive through queuing considerations; and,
- Study recommendations.

Analysis Methodology

All operational analyses described in this report were performed in accordance with the procedures stated in the *Highway Capacity Manual* (HCM). HCM 7th Edition was used to assess intersection performance per ODOT requirements (Reference 1). Per ODOT requirements, the peak 15-minute flow rates were used in the evaluation of all intersection volume-to-capacity (V/C) ratios. The operations analysis presented in this report was completed using Vistro software.

ODOT INTERSECTION OPERATION STANDARDS

Per Table 7 of the *Oregon Highway Plan* (OHP, Reference 2), the mobility target for the two signalized intersections at N 4th Avenue along both E Baseline Street and N Adair Street is a maximum V/C ratio of 0.99. The side street approach mobility target for unsignalized intersections on both E Baseline Street and N Adair Street is also a maximum V/C ratio of 0.99.

Existing Conditions

This section summarizes the existing characteristics of the transportation system and adjacent land uses in the vicinity of the proposed development, including an inventory of the existing multimodal transportation facilities, a summary of recent crash history and an evaluation of existing intersection operations for motor vehicles at the study intersections.

Site Conditions and Adjacent Land Uses

The proposed Chick-fil-A would replace three existing homes and a seasonal farm stand situated between N Adair Street and W Baseline Street west of N 4th Avenue today. Land uses along N Adair Street north the site are primarily retail in nature, including a Walmart Supercenter, a local grocer, and a restaurant. The land use along N 4th Avenue and W Baseline Street east and south of the project site is primarily residential but also includes some commercial development directly to the east and west. Two fast food restaurants with drive through window service and access on both N Adair Street and W Baseline Street are located within one block west of the project site.

Transportation Facilities

Table 1 summarizes the attributes of key roadway facilities in the vicinity of the project site. Figure 3 illustrates the existing lane configurations and traffic control devices at the study intersections.

Table 1: Roadway Characteristics

Roadway	Classification[1]	Motor Vehicle Travel Lanes	Posted Speed	Sidewalk Present?	Striped Bicycle Lanes Present?	On-Street Parking Allowed?
N Adair Street (OR-8)	Principal Arterial	2	40 mph	Partial[2]	Yes	No
W Baseline Street (OR-8)	Principal Arterial	2	40 mph	Partial[3]	Yes	No
N 4th Avenue	Collector	4	25 mph	Partial[4]	Partial[5]	No

[1] Per the *2020 Cornelius Transportation System Plan*, Chapter 8, Figure 8-1 (Reference 3)

[2] Sidewalks are provided on the north side of N Adair Street except for an approximately 185-foot-long segment along the frontage of Jose's Tires approximately 220' west of the project site. On the south side of N Adair Street, there is an existing sidewalk starting immediately west of the project site boundary; however, there is no sidewalk provided along the site frontage today.

[3] Sidewalks are provided on the south side of W Baseline Street extending approximately 190 feet west of the intersection with 4th Avenue. On the north side of W Baseline Street, a sidewalk is provided starting 75 west of the project site, continuing approximately 1,100 feet further west to the intersection with Yew Street. There is no sidewalk provided along the site frontage today.

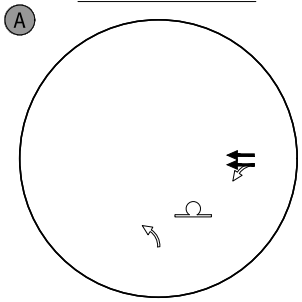
[4] Between N Adair Street and W Baseline Street, sidewalks are only present on the west side of N 4th Avenue. North of N Adair Street and south of W Baseline Street, sidewalks are present on both sides of N 4th Avenue.

[5] A southbound striped bicycle lane is provided north of N Adair Street. No other bicycle facilities are present on 4th Avenue.

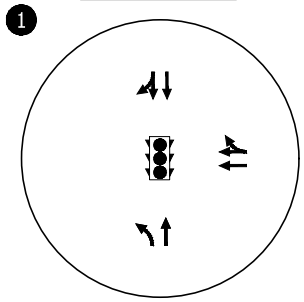
There is an at-grade railroad crossing of S 4th Avenue located approximately 140 feet south of the intersection with W Baseline Street. The Portland & Western Railroad crossing has active control devices including flashing lights, gates, and audible bells



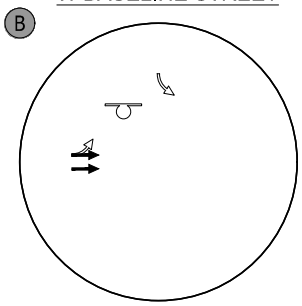
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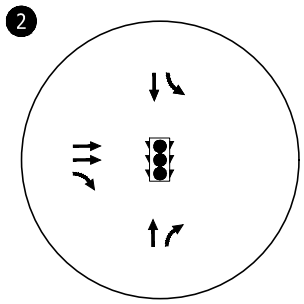
N ADAIR STREET /
N 4TH AVENUE



PROPOSED SITE ACCESS DRIVEWAY/
W BASELINE STREET



W BASELINE STREET /
N/S 4TH AVENUE



- STOP SIGN
- TRAFFIC SIGNAL
- EXISTING LANE CONFIGURATION
- FUTURE LANE CONFIGURATION AND TRAFFIC CONTROL

Existing & Assumed Future Lane Configurations & Traffic Control Devices
Cornelius, OR

Figure 3

H:\30\30770 - Cornelius Chick-fil-A\002 - Traffic Impact Study\report\figs\30770 - Report Figures.dwg Sep 16, 2024 - 1:36pm - cbennett Layout Tab: 3 - ELC & TCD

Transit Facilities

TriMet (Reference 4) provides fixed route bus service along N Adair Street and W Baseline Street through the study area via Line 57, TV Highway/Forest Grove. Line 57 is a designated frequent service line with 15-minute frequency during daytime hours. The line provides service to the Beaverton Transit Center east of the site, providing additional regional access to/from the site. The existing bus stops nearest the proposed site are located on the north side of N Adair Street and the south side of W Baseline Street directly west of N 4th Avenue. Both stops are equipped with glass panel shelters with benches. There are additional stops for line 57 along OR-8 at Yew Street to the west, and at N 10th Avenue to the east.

Cornelius Link is a free weekday public transportation service operated by Ride Connection providing a single bus route that circulates within Cornelius and Forest Grove. The bus operates hourly 6:30 AM – 7:00 PM, Monday through Friday. There are westbound stops in the vicinity of the project site at N 4th Street just north of N Adair Street, and at Yew Street and N Adair Street. The service began operation in August 2024. In addition to designated stops, people living along residential streets on the route can flag the bus down to board. The Cornelius Link provides people with access to TriMet service at two locations within the City as well.

Facilities for People Walking and Riding Bikes

As noted in Table 1, there is a continuous, curb tight sidewalk along the N 4th Avenue site frontage today, but no sidewalk along the site frontages along N Adair Street or W Baseline Street. New sidewalks with landscape buffers will be constructed along the site frontages on N Adair Street and W Baseline Street, and the sidewalk will be repaired where existing site accesses are removed along N 4th Avenue with the proposed site development, as shown in Figure 2. Striped crosswalks and crossing signals are present on all four legs of both signalized study intersections.

There are 6-foot-wide painted bicycle lanes along both N Adair Street and W Baseline Street in the vicinity of the project site. There is a southbound striped bicycle lane on N 4th Avenue north of N Adair Street, but it is dropped at the intersection.

The *City of Cornelius 2020 Transportation System Plan* includes the following projects planned to provide bicycle and pedestrian improvements in the vicinity of the project site:

- C1 – evaluate the need for a shared use path and highway crossings of N Adair Street and W Baseline Street between Walmart and 1st Avenue; high priority project to be funded by City Urban Renewal
- P3, P4, P5, P6a, P6b – fill pedestrian facility gaps on both sides of N Adair Street and W Baseline Street in the project vicinity; high, medium, and low priority projects to be funded by Washington County Transportation Development Tax and City Urban Renewal
- B2 and B4 – install bike facilities on N 4th Avenue from W Baseline Street to the northern terminus of N 4th Avenue; medium-priority project to be included in the strategic plan
- B22 – construct a two-way bike boulevard along the south side of W Baseline Street; low priority project to be included in the strategic plan

The plan also identifies S 4th Avenue south of W Baseline Street as a planned shared street.

The new sidewalk facilities along the proposed restaurant site frontage improvements will help complete sidewalk gaps identified in the *Transportation System Plan, particularly portions of Projects P5 and B4.*

Crash History Analysis

The ODOT Crash Data System was queried to obtain crash records at the two existing study intersections for the five-year period from January 1, 2018, to December 31, 2022. The crash type classifications at each intersection were reviewed to assess whether crash patterns might be identifiable. Table 2 summarizes the reported crashes by type and severity. No fatal crashes were reported. *Appendix A provides detailed crash data at the study intersections.*

Table 2: Reported Crash History (2018 – 2022)

Study Intersection		Crash Type								Severity				Total
#	Location	Angle	Turn	Rear-End	Side Swipe	Fixed Object	Pedestrian/ Bike	Head-On	Backing	Property Damage Only	Injury	Injury A	Fatal	
1	N Adair Street/ N 4th Avenue	7	14	6	0	1	2	0	0	11	17	2	0	30
2	W Baseline Street/ 4th Avenue	4	5	4	0	0	0	0	0	2	10	1	0	13

As shown in Table 2, there were two reported crashes involving a pedestrian, both of which were classified as an Injury A (major injury crash) at the N Adair Street/N 4th Avenue intersection. Further details on each are discussed below.

- On April 12, 2021 at 7 PM under dry clear dusk conditions, a pedestrian crossing N Adair Street was struck by a motorist traveling westbound through on N Adair Street. The crash was attributed to the pedestrian's inattention and disregarding the traffic signal to cross when the westbound motor vehicle movement had the green indication.
- On January 18, 2022 at 5 PM under rainy dusk conditions, a northbound right-turning driver struck a pedestrian crossing the intersection. The crash was attributable to the pedestrian not being visible to the motorist.

At the W Baseline Street/S 4th Avenue intersection, one Injury A crash was reported on March 4, 2019 at noon. The crash involved a southbound left-turning vehicle and a northbound through vehicle. The crash was attributed to the left-turning motorist turning when there was not a gap in the northbound through traffic. The traffic signal operates with north-south permissive phasing along N 4th Avenue.

Critical crash rates were calculated for the two signalized study intersections following the analysis methodology presented in the ODOT *Analysis Procedures Manual* (*APM,* Reference 5). *APM* Chapter 4 provides 90th percentile crash rates per million entering vehicles at a variety of intersection configurations based on number of approaches and traffic control types. The critical crash rate for each intersection is calculated based on the average crash rate for each facility and serves as a threshold for further analysis. Per the APM, intersections with crash rates that exceed the 90th percentile values shown in *APM* Exhibit 4-1 or with a crash rate that exceeds its critical crash rate should be flagged for further analysis. Table 3 summarizes the crash rate assessment for each intersection and compares those values to the observed crash rate.

As shown in Table 3, the N Adair Street/N 4th Avenue intersection crash rate is greater than the 90th percentile crash rate. There is no predominant crash type among the 30 reported crashes in the five-year period. Ten crashes involved a vehicle making a permitted northbound left turn, seven of which collided with a vehicle making a southbound through movement. The traffic signal operates with north-south

permissive phasing along N 4th Avenue[1]. Eight crashes occurred between westbound vehicles and vehicles traveling through the intersection northbound or southbound. All six rear-end crashes occurred between vehicles heading westbound on N Adair Street.

Table 3: Intersection Critical Crash Rate Assessment

Study Intersection		90th Percentile Rate[1,2]	Observed Crash Rate[1]	Observed Crash Rate > 90th Percentile Rate
#	Location			
1	N Adair Street/N 4th Avenue	0.509	**0.79**	**Yes**
2	W Baseline Street/N 4th Avenue	0.509	0.43	No

[1] Crash Rate reported as crashes per million entering vehicles (crashes/MEV)

[2] Values shown were obtained from APM Exhibit 4-1, Intersection Crash Rates per MEV by Land Type and Traffic Control

ODOT SPIS List

ODOT maintains Safety Priority Index System (SPIS) lists to help the region prioritize locations for further safety review. Per the 2022 SPIS list, the N Adair Street/N 4th Avenue is listed as a Top 5 percent location and the W Baseline Street/N 4th Avenue intersection is a Top 10 percent location. There are also Top 5 and Top 10 percent SPIS locations near or at some of the existing site access points on N Adair Street and W Baseline Street that will be vacated and closed.

Washington County SPIS List

Washington County's Safety Priority Index System (SPIS) List (2019-2021) includes a ranking of intersection crashes on a biennial cycle. Intersections are included in the County SPIS list if they have three or more crashes or if they have one or more severe injury or fatal crashes within three consecutive years. Neither of the signalized study intersections appear on the SPIS list.

Site Development Considerations

No specific safety-based mitigations were identified for implementation at the two signalized study intersections in conjunction with the proposed restaurant development as a function of the crash data review findings. ODOT may consider monitoring the potential for future implementation of northbound protected-permitted left turn control on the intersection based on the future intersection crash history or other applicable criteria in the then-current *ODOT Traffic Signal Policy and Guidelines*.

The proposed restaurant development will reconstruct the project site frontage along both N Adair Street and W Baseline Street as will be described later in this report. The project frontage changes will enhance access management along both roadways (reducing the number of site accesses and locating the new access away from N 4th Avenue to the extent possible). In addition, the project frontage changes will provide new sidewalk facilities with landscape strips along both N Adair Street and W Baseline Street where

[1] The northbound left-turn movement does not appear to satisfy ODOT criteria for a flashing yellow arrow protected-permissive left-turn move as identified in the July 2024 *ODOT Traffic Signal Policy and Guidelines*. Referring to Section 4.1.1.2 of the *Guidelines*, the left-turn volume does not exceed 200 vehicles per hour and the cross product of opposing through and left-turn hourly volumes does not exceed the ODOT volume-based criteria. The crash history threshold of five or more crashes involving left-turns per approach in a consecutive 12-month period within the last three years identified in Section 4.1.1.1 of the *Guidelines* for protected only left-turn mode is also not satisfied.

there are none today, as well as new street lighting. In addition, both existing driveway access points on N 4th Avenue will be closed and vacated.

Existing Conditions Operational Analysis

Vehicle turning movement, pedestrian and bicycle counts were collected at the study intersections in August 2024. The counts were conducted during the weekday morning (7:00 – 9:00 AM) and evening (4:00 – 6:00 PM) peak periods. Local schools were not in session at the time of the traffic counts[2].

On the day of the counts, the morning peak hour occurred from 8:00 AM – 9:00 AM at N Adair Street/N 4th Avenue and 7:05 AM – 8:05 AM at W Baseline Street/N 4th Avenue. The PM peak hour occurred from 4:25 PM – 5:25 PM at N Adair Street/N 4th Avenue and 4:15 PM – 5:15 PM at W Baseline Street/N 4th Avenue. The peak hour of each intersection determined the peak hour analyzed at the future site access driveways on N Adair Street and W Baseline Street, respectively. *Appendix B contains the traffic count worksheets*.

A seasonal farm stand was in operation on the project site from approximately 10:00 AM to approximately 5:00 PM on the day of the traffic count data collection. Trips associated with the farm stand were included in the signalized intersection counts as-is (no effort was made to remove the trips in anticipation of the proposed restaurant development or to take credit for them, recognizing the seasonal nature of the farm stand business).

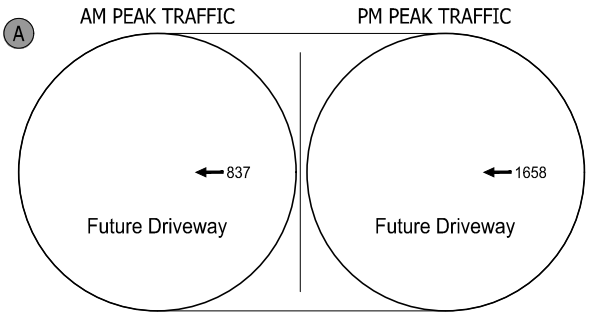
Current traffic signal phasing and signal cycle length information for the two signalized study intersections were obtained from ODOT.

Figure 4 summarizes the existing traffic conditions at the study intersections during the weekday AM and PM peak hours. As shown, the study intersection operations satisfy applicable ODOT V/C ratio mobility targets during both peak hours. *Existing conditions operations analysis worksheets are provided in Appendix C*.

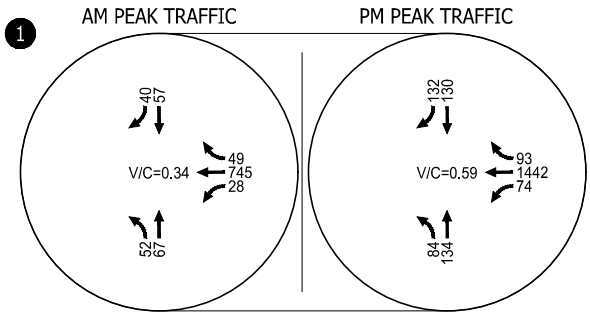
[2] We note that review of ODOT's Automatic Traffic Recorder (ATR) #34-009 located on OR 8 (TV Highway) 0.28 mile west of NW 334th Avenue on the east side City of Cornelius recorded peak weekday average traffic during the month of August in 2019 and 2022 and during the month of in May 2023 (May 2023 average weekday count of 38,555 vehicles compared to August count of 38,229 vehicles). Based on these trends, no adjustments were applied to the existing traffic counts to reach 30th highest hour volumes.



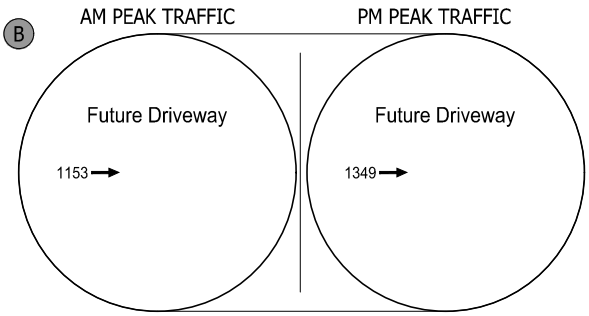
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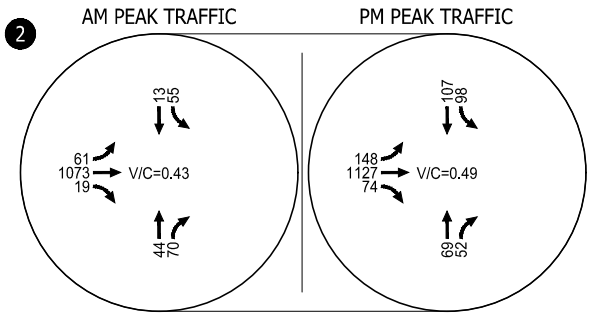
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PROPOSED SITE ACCESS DRIVEWAY/
W BASELINE STREET



W BASELINE STREET /
N/S 4TH AVENUE



LOS = LEVEL OF SERVICE
DEL = AVERAGE INTERSECTION DELAY (SECONDS)
V/C = INTERSECTION VOLUME-TO-CAPACITY RATIO (SIGNALIZED) / CRITICAL MOVEMENT VOLUME-TO-CAPACITY RATIO (UNSIGNALIZED)

Existing Traffic Conditions
AM & PM Peak Hours
Cornelius, OR

Figure
4

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Transportation Impact Analysis

The transportation impact analysis identifies how the study intersections will operate in the year 2026 upon occupancy of the restaurant. This section of the report includes analysis of 2026 background traffic volumes and intersection operations, an estimate of existing and proposed site-generated trips, analysis of 2026 total traffic volumes and intersection operations, queuing and turn lane considerations, consistency with ODOT access spacing requirements, and site circulation considerations including sight distance, drive-through queuing, and delivery truck circulation.

2026 Background Operational Analysis

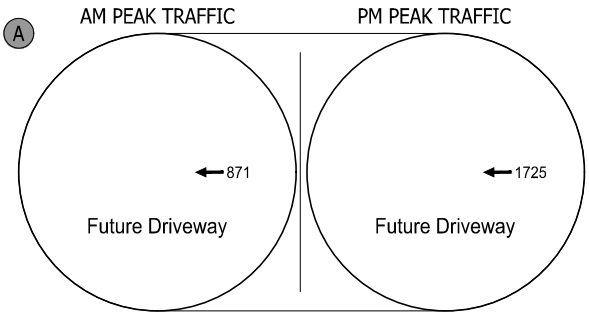
A two-percent annual growth rate was applied to the existing traffic volumes to reflect near-term growth for background traffic. No vehicle capacity changes to the study intersections were identified by ODOT or the City that would occur prior to 2026.

One in-process development was identified in the site vicinity by the City. A warehouse was recently constructed and leased to a heavy equipment provider on the northeast corner of N 4th Avenue and N Holladay Street, approximately ½ mile north of the site. At the time traffic counts were obtained, the facility was not yet occupied. Vehicle trip impacts to the study intersections associated with the equipment provider were assumed to be minimal given the new building can be accessed by both N Holladay Street and N 4th Avenue and no traffic study was prepared for the use. Vehicle trips associated with the future heavy equipment provider building were assumed to be accounted for through application of the background growth rate given 1) the limited trip potential of the equipment provider building and the access available to the new building, 2) N 4th Avenue terminates approximately 0.5 mile north of N Adair Street and has limited near-term development potential, 3) trips associated with the Wal-Mart site directly northeast of the N Adair Street/N 4th Avenue intersection are effectively being increased through application of the growth rate).

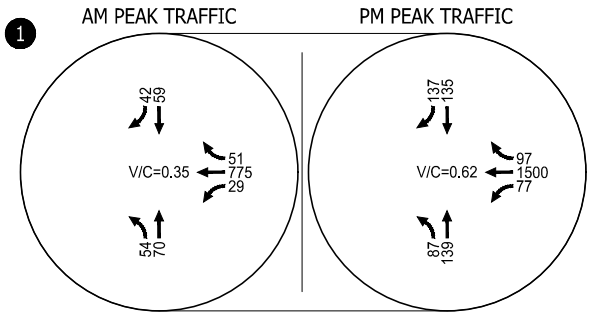
Figure 5 illustrates the 2026 background traffic volumes and corresponding operational analysis for the weekday AM and PM peak hours. As shown, all the study intersections are expected to continue to satisfy applicable ODOT V/C ratio mobility targets under background conditions. *Appendix D includes the operations analysis worksheets.*



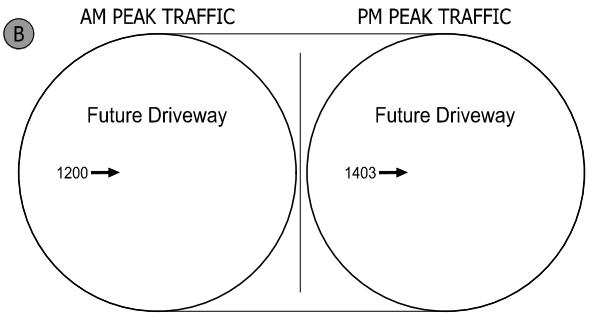
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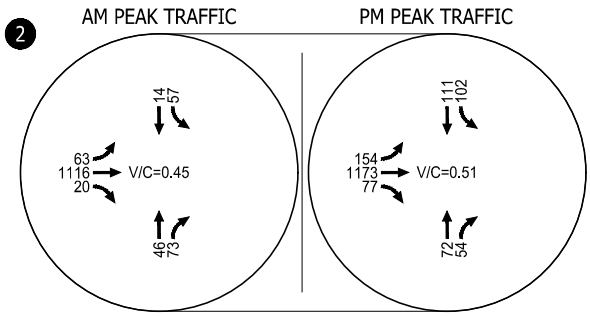
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PROPOSED SITE ACCESS DRIVEWAY/
W BASELINE STREET



W BASELINE STREET /
N/S 4TH AVENUE



LOS = LEVEL OF SERVICE
DEL = AVERAGE INTERSECTION DELAY (SECONDS)
V/C = INTERSECTION VOLUME-TO-CAPACITY RATIO (SIGNALIZED) / CRITICAL MOVEMENT VOLUME-TO-CAPACITY RATIO (UNSIGNALIZED)

Year 2026 Background Traffic Conditions
AM & PM Peak Hours
Cornelius, OR

Figure
5

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Proposed Development Plan

The proposed 4,855 square foot Chick-fil-A restaurant will replace three existing homes on the project site. The proposed Chick-fil-A will vacate the existing access on N Adair Street, two existing accesses on N 4th Avenue, and three existing accesses on W Baseline Street. The development will provide one new left in/left out access approximately 25 feet east of the western property line on W Baseline Street, and one new left in/left out access on N Adair Street even with the access on W Baseline Street. The restaurant parking lot will provide a connection between the two proposed accesses.

Trip Generation Credit for Existing Buildings to Be Removed

Trip estimates for the three single family homes on the project site were estimated using data from the *Trip Generation Manual, 11th Edition* (Reference 6) for documentation purposes.

No trip credit was assumed for the existing homes or farm stand on the site today for traffic operations analysis purposes. However, it would be appropriate to apply a credit for these uses in the assessment of the Transportation Development Tax (TDT) associated with the new restaurant.

Chick-fil-A Trip Generation Estimate

A trip generation study was conducted at four Chick-fil-A sites in the greater Portland area and one in Keizer in 2022. The five sites studied include one in Tanasbourne (Hillsboro, opened March 2016), one on Beaverton-Hillsdale Highway (opened June 2019), one in the Cedar Hills Crossing area (opened July 2019), one on TV Highway in Hillsboro (opened April 14, 2022), and one in Keizer Station (opened August 4, 2022). Trip generation rates were calculated based on the data collected at these five sites per the ITE *Trip Generation Handbook* methodology.

The resultant trip rates (as measured as vehicle trips per 1,000 square feet of building) observed at the five sites during the weekday AM and PM peak hours are provided in *Appendix E*. In reviewing the data, we note the following:

- Daily trips were only counted at the Keizer Station site. Weekday AM and PM peak hour trips were collected at all five sites.
- Tanasbourne has been open the longest of the five sites surveyed (Tanasbourne and the existing Clackamas Chick-fil-A opened at the same time). The trip generation rates at this store are higher than the others during the PM peak period, a reflection of its proximity to US 26 and NW 185th Avenue.
- The TV Highway location that was added in 2022 serves Hillsboro/Aloha customers previously served primarily by Tanasbourne. Despite its being open for approximately five weeks at the time of traffic count data collection, this store had the lowest trip rates of the five locations surveyed. Chick-fil-A indicates that it is common for their new stores in an existing market to not experience the same level of grand opening interest as compared to openings in new markets.

With these considerations in mind but still to provide a reasonable estimate of potential trip generation, we used the average peak rate of the three highest sites measured and excluded the data from the TV Highway site and the Cedar Hills Boulevard site (the lowest of the five). A comparison of the average rates using the three higher versus all five sites as well as to the rates reflected in the *Trip Generation Manual* is shown below:

- Trips per 1,000 square feet based on all five sites = 16.2 during the weekday AM peak hour and 46.9 during the weekday PM peak hour

- Trips per 1,000 square feet based on three sites (excluding TV Highway and Cedar Hills Boulevard) = 18.3 during the weekday AM peak hour and 55.1 during the weekday PM peak hour

- Trips per 1,000 square feet from the *Trip Generation Manual* for a fast food restaurant with a drive through = 44.6 during the AM peak hour and 33.03 during the weekday PM peak hour

Table 4 shows daily and AM and PM peak hour trip estimates for the existing homes and the proposed restaurant using the average of the three highest Oregon sites measured in 2022. Note that no trips were assumed for the existing seasonal farm stand.

Table 4: Trip Generation Estimates

Land Use	Data Source	Size	Daily Trips	AM Peak Hour			PM Peak Hour		
				Total	In	Out	Total	In	Out
Existing Homes to Be Removed									
Single Family Detached Home	ITE Land Use Code 210	3 homes	28	2	1	1	3	2	1
Proposed Chick-fil-A									
Chick-fil-A	Oregon Chick-fil-A Site Data	4,855 sq ft	3,033	89	46	43	268	143	125
Less Pass-by Trips[1] (50% AM & Daily, 55% PM)			*-1,517*	*-45*	*-23*	*-22*	*-147*	*-79*	*-68*
Total Net New			1,516	44	23	21	121	64	57
Proposed Net New – Existing Net New			**1,488**	**42**	**22**	**20**	**118**	**62**	**56**

[1] Assumed pass-by rate of 50% AM peak hour & daily, 55% PM peak hour per fast food restaurant with drive through window data in the *Trip Generation Manual, 11th Edition*

Trip Distribution/Assignment

The trip distribution pattern for the proposed restaurant is based on existing travel patterns, the location of major trip origins and destinations in the study area, and the proximity of other Chick-fil-A restaurants in Washington County.

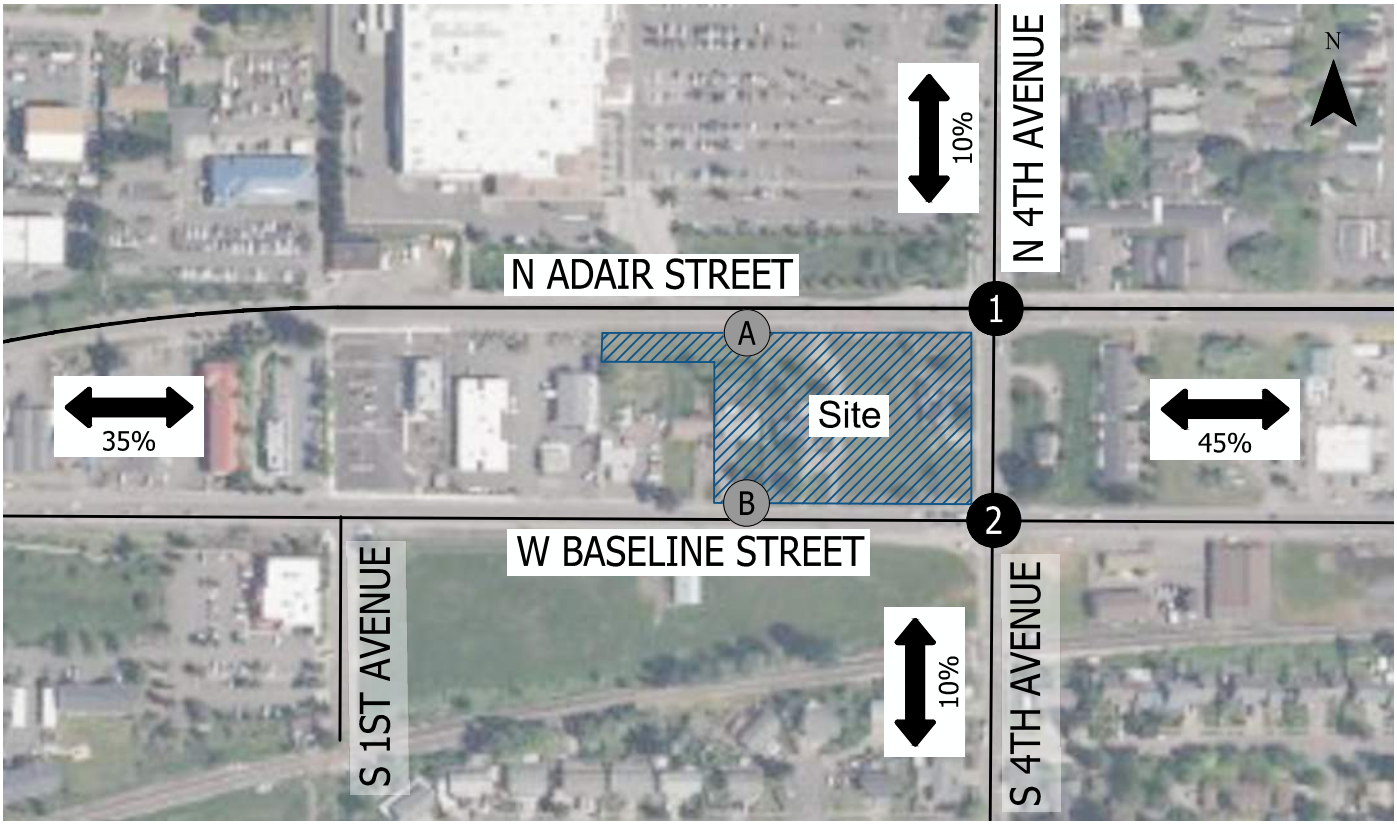
The nearest Chick-fil-A is located approximately 8.5 miles to the east at 6810 SE Carlyle Street along the north side of OR-8 in Hillsboro. Given the site to the east and considering local population densities, the trip distribution pattern shown in Figure 6 was identified in coordination with City and ODOT staff.

For analysis purposes, trip assignment was conducted sequentially using the following incremental steps:

1. The Chick-fil-A pass-by trips shown in Table 4 were added to the study intersections. Pass-by trips for the restaurant were assumed to originate on the state highway and travel to/from the site via N Adair Street and W Baseline Street to provide a conservative analysis of the signalized intersection operations (in reality, some future northbound and southbound pass-by trips made are likely to be made by Chick-fil-A customers traveling along 4th Avenue associated with nearby retail opportunities). Pass-by traffic was estimated to be 60% eastbound in the AM peak period, and 60% westbound in the PM peak period.

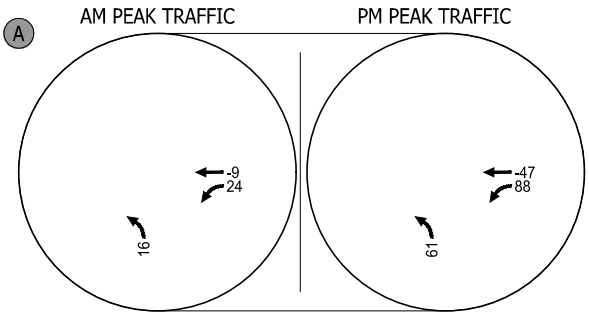
2. The increase in net new trips shown in Table 4 was added to the study intersections.

The cumulative result of the steps above is a study intersection trip assignment that reflects the total trip generation of the proposed restaurant (46 entering and 43 exiting AM peak hour trips, and 143 entering



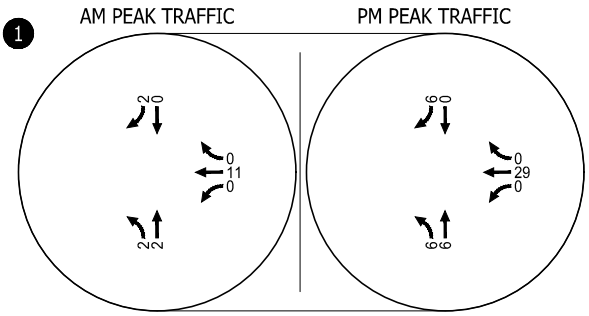
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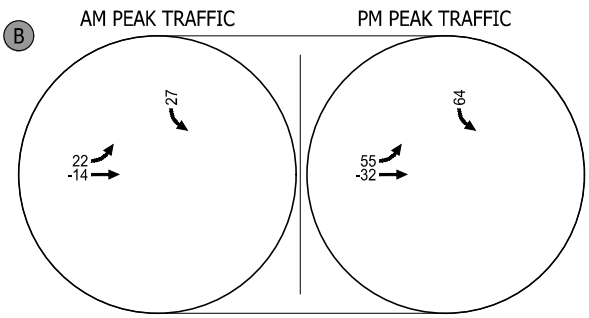
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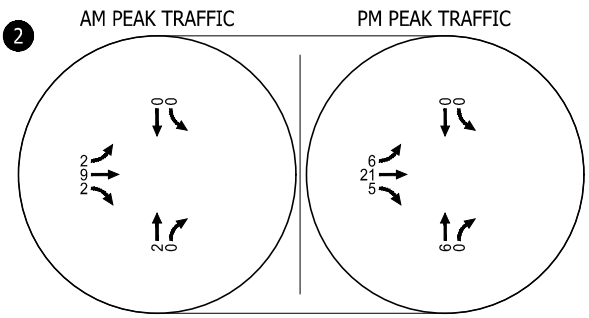
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W BASELINE STREET /
N/S 4TH AVENUE

2



- TRIP DISTRIBUTION
XX

Note: Negative traffic volumes reflect pass-by trips.

Estimated Trip Distribution Pattern & Site-Generated Trip Assignment, AM & PM Peak Hours
Cornelius, OR

Figure
6

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and 125 exiting PM peak hour trips). The trip distribution pattern as well as weekday AM and PM peak hour site-generated trips are summarized in Figure 6[3]. *Appendix G also includes figures illustrating the assumed existing trip re-route, pass-by and net new trip assignments.*

Year 2026 Total Traffic Conditions

The total traffic conditions analysis forecasts how the study intersections will operate with the traffic generated by the proposed Chick-fil-A. The site-generated traffic shown in Figure 6 was added to the year 2026 background traffic volumes shown in Figure 5 to arrive at the total traffic volumes for the weekday AM and PM peak hours shown in Figure 7. Figure 7 also presents the corresponding traffic operations at the study intersections. *Appendix H contains the 2026 Total Traffic Conditions intersection analysis worksheets.*

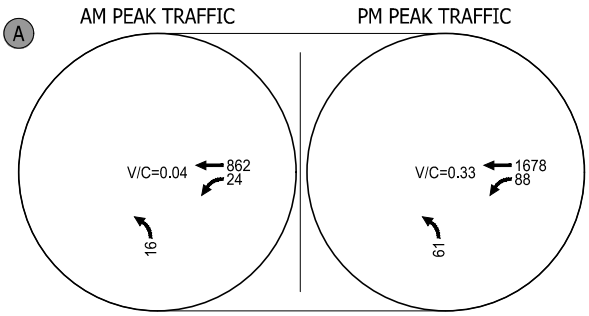
As shown, all the study intersections are expected to continue to satisfy applicable ODOT V/C ratio mobility targets under total traffic conditions.

We recommend Chick-fil-A place new STOP (R1-1) signs for vehicles exiting the site at the two new site access driveways onto N Adair Street and W Baseline Street in accordance with City and ODOT standards and the *Manual on Uniform Traffic Control Devices* (MUTCD).

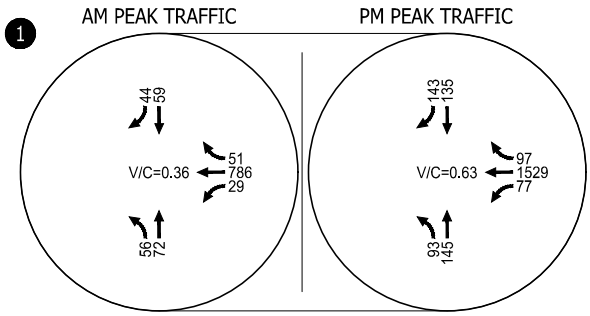
[3] Figure 6 provides the sum of the Proposed Net New + Pass-by Trips shown in Table 4. See Appendix G for a further breakdown of the net new and pass-by site trips.



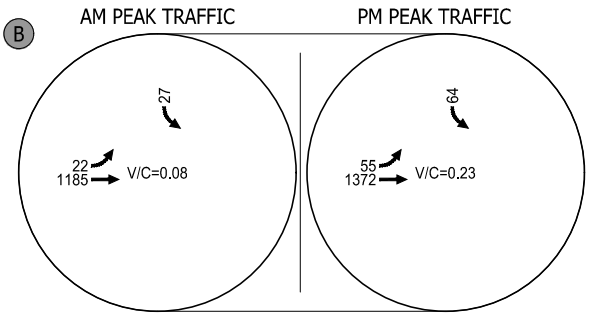
PROPOSED SITE ACCESS DRIVEWAY/
N ADAIR STREET



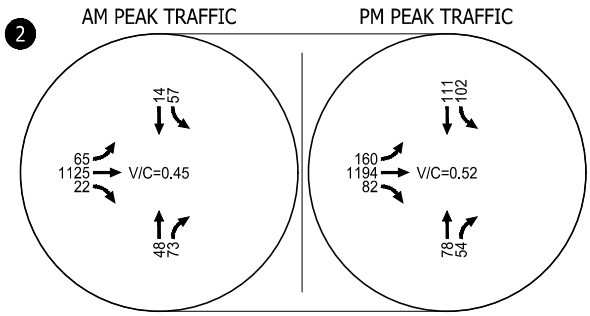
N ADAIR STREET /
N 4TH AVENUE



PROPOSED SITE ACCESS DRIVEWAY/
W BASELINE STREET



W BASELINE STREET /
N/S 4TH AVENUE



LOS = LEVEL OF SERVICE
DEL = AVERAGE INTERSECTION DELAY (SIGNALIZED) / CRITICAL MOVEMENT INTERSECTION DELAY (UNSIGNALIZED)
V/C = INTERSECTION VOLUME-TO-CAPACITY RATIO (SIGNALIZED) / CRITICAL MOVEMENT VOLUME-TO-CAPACITY RATIO (UNSIGNALIZED)

Year 2026 Total Traffic Conditions
AM & PM Peak Hours
Cornelius, OR

Figure
7

H:\30\30770 - Cornelius Chick-fil-A\002 - Traffic Impact Study\report\figs\30770 - Report Figures.dwg Sep 16, 2024 - 1:36pm - cbennett Layout Tab: 7 - Total Traffic

95th Percentile Queuing Analysis

A 95th-percentile queuing analysis was performed in Vistro at each of the study intersections for all analysis scenarios to address the queuing analysis requirements identified in the ODOT *APM* Section 12.5 and 13.5. *Queue reports from Vistro are included in Appendices "C", "D", and "H".* Table 5 summarizes the existing and estimated future year 2026 95th-percentile queues during the weekday AM and PM peak hours. Queues are rounded up to the nearest vehicle length (approximately 25 feet).

Table 5: Summary of 95th-Percentile Queues

Study Intersection		Move-ment	Available Storage (feet)	2024 Existing Traffic Conditions		2026 Background Traffic Conditions		2026 Total Traffic Conditions	
#	Location			AM (feet)	PM (feet)	AM (feet)	PM (feet)	AM (feet)	PM (feet)
1	N Adair Street / N 4th Avenue	NBL	225	75	100	75	100	75	100
		NBT	225	75	125	75	125	75	150
		SBT	175	50	125	50	125	50	125
		SBRT	300	50	125	50	125	50	125
		WBLT	>500[1]	75	300	100	350	100	325
		WBRT	>500[1]	75	300	100	350	100	325
2	W Baseline Street / 4th Avenue	NBT	125[2]	50	75	50	75	50	75
		NBR	125[2]	50	50	50	50	50	50
		SBL	225	75	125	75	125	75	125
		SBT	225	25	100	25	125	25	125
		EBLT	>350[3]	100	200	150	225	150	250
		EBT	>500[4]	100	200	150	225	150	250
		EBR	75	25	25	25	25	25	25
A	N Adair Street / Site Access A	NBL	175	-	-	-	-	25	50
B	W Baseline Street / Site Access B	SBL	175	-	-	-	-	25	25

Where: EB = Eastbound, WB = Westbound, NB = Northbound, SB = Southbound, L = left-turn, T=through, R=right, LT = shared left/through, TR = shared through/right

[1] There are private driveways located on the north and south sides of N Adair Street located east of N 4th Avenue, but no north-south public streets for 975 feet to the east.

[2] There is an at-grade rail crossing on S 4th Avenue approximately 150' south of the crosswalk on the southern leg of the intersection of W Baseline Street and S 4th Avenue.

[3] Distance shown is from the eastbound stop bar on W Baseline Street at 4th Avenue to the east side of the proposed restaurant access.

[4] There are private driveways located on the north and south sides of W Baseline Street located west of 4th Avenue; the nearest north-south public street is located approximately 925 feet to the west.

No queues at the study intersections are expected to exceed the available storage space in the background or total condition with the proposed restaurant.

We note that the single vehicle reduction shown in the projected 95th percentile weekday PM peak hour westbound signalized queue along N Adair Street is a function of both rounding and the effective green time allocation associated with the existing signal timing settings rather than a change in intersection capacity. The unrounded background queue length is projected at 327 feet (rounded up to 350 feet) while the unrounded total traffic queue projected at 308 feet (rounded up to 325 feet). As such, the change in westbound queues in the field is likely to not be perceptible.

Turn Lane Considerations

The potential need for turn lanes at the site driveways was evaluated per the ODOT *APM* Exhibit 12-2: Right Turn Lane Criterion, recognizing the proposed site accesses will be restricted to left-in/left-out movements (left-turn movements on a one-way street system are functionally equivalent to right-turn movements on a two-way street grid).

Based on the projected left-turn volumes into the site shown in Figure 7, the ODOT criteria for providing a separate left-turn lane is met at both of the proposed site accesses along N Adair Street and W Baseline Street in the PM peak hour. The evaluation of the turn lane criteria is included in Appendix H.

While the APM volume-based criteria to provide a separate turn lane is satisfied, we do not recommend requiring turn lane installation with site development for the following reasons:

- Per the APM, meeting the criteria does not require a turn lane to be installed. Engineering judgment must be used to determine if an installation would be safe and practical. Further, "The purpose of a right turn lane at an unsignalized intersection is to improve safety and to maximize the capacity of a roadway by reducing the speed differential between the right turning vehicles and the other vehicles on the roadway" and "The vehicular volume criterion is intended for application where the volume of intersecting traffic is the principal reason for considering installation of a right turn lane."
- One of the requirements in the APM turn lane evaluation process to require a turn lane is that "The right turn lane conforms to applicable local, regional and state plans."
- The proposed development is located in an urban area along a couplet serving multiple commercial properties including two fast-food restaurants with drive-through windows located less than 500 feet to the west. Multiple other fast-food restaurants with drive through windows, a bank with drive through service, fuel stations and other similar convenience-oriented businesses are located between (and have access on) N Adair Street and W Baseline Street. No private driveway access in the City has a separate left-turn lane into an access on N Adair Street and W Baseline Street along the couplet. As such, corridor consistency and driver expectations are maintained *not* providing a separate turn lane into the project site accesses.
- The adopted City *Transportation System Plan* does not identify or seek separate left-turn lanes along the site frontage nor along N Adair Street and W Baseline Street through the couplet area. Further, City Public Works staff confirmed that the provision of left-turn deceleration lanes is not consistent with the long-term vision for the corridor.
- The access changes proposed by the project consolidate and reduce the existing site access point along both N Adair Street and W Baseline Street. In addition, the new accesses will be located as far away from the intersections with N 4th Avenue to the extent possible.
- As discussed in a subsequent section of this report, the proposed development has been configured to accommodate all anticipated drive-through queuing on-site. No queue spillback from the site onto N Adair Street or W Baseline Street is expected.

Access Spacing

The *Oregon Highway Plan* Appendix C, Table 14 defines ODOT access management standards for state highways with Annual Average Daily Traffic (AADT) of more than 5,000 vehicles. Table 14 requires access to such state highways in urban areas to be spaced at a minimum of 800' when the posted speed limit is 40 mph. As indicated in Note 1 for Table 14, this standard is reduced by half to 400' for one-way highways.

As proposed, the site access on N Adair Street will be located approximately 390' west of the intersection with N 4th Avenue and 310' east of the nearest business access driveway. The site access on W Baseline

Street will be located approximately 390' west of the intersection with 4th Avenue and 60' east of the nearest private property access driveway.

Although the proposed driveways are closer than the access management standards in the OHP, the proposed driveway locations are positioned as far away from the existing traffic signals as possible, as requested by ODOT. This site plan provides as much spacing as is feasible and improves on the existing condition both in terms of the number and location of the accesses. As shown in Exhibit 1, existing accesses to the site are spaced notably closer to the intersections and adjacent accesses, with accesses approximately 260' west of the intersection of N 4th Avenue and N Adair Street, 240' west of the intersection of 4th Avenue and W Baseline Street, and on N 4th Avenue within 120' of both intersections. The applicant proposes to vacate all six existing site accesses.

Accesses along the OR-8 corridor in the project vicinity are generally spaced at less than 400 feet both east and west of the project site. The proposed access spacing for the development moves in the direction of satisfying the minimum spacing requirement to the extent practical and improves upon the historic spacing precedent despite not meeting the standard.

Exhibit 1: Existing Site Access Spacing



Aerial Image Source: Google Earth

Although the proposed Chick-fil-A accesses on N Adair Street and W Baseline Street cannot satisfy the minimum 400 feet spacing standard due to the length and configuration of the site frontages, we recommend left-in/left-out access be provided as proposed considering 1) the proposed location maximizes the available storage west of 4th Avenue; 2) the proposed site access plan considerably reduces the number of accesses provided to the project site; 3) the proposed site access plan improves on the precedent established along N Adair Street and W Baseline Street in the site vicinity. As proposed, total accesses would be consolidated from six to two, and access to N 4th Avenue between N Adair Street and W Baseline Steet would be removed entirely.

Site Circulation Considerations

Driveway Sight Distance

We recommend intersection sight distance be provided at the proposed Chick-fil-A accesses per the applicable design requirements and that landscaping, above ground utilities, and signing be located and maintained in a manner that preserves adequate intersection sight distance. The proposed new site driveway sight distance compliance is documented within the project civil engineering plans, a portion of which are included in *Appendix I*.

Drive Through Queuing

The site has been designed to maximize on-site queueing space available for customers using the drive-through. Two drive-through lanes are provided, and both are served at the pick-up area via a drive-through door that staff use to deliver meals. The drive-through is designed to store approximately 32 vehicles on-site[4] based on the size and spacing of typical customer vehicles (including the two vehicles at the pick-up area).

A queuing study was conducted at four Portland area Chick-fil-A sites in May 2022. The overall maximum observed drive through queue was 29 vehicles during the PM peak hour at the Tanasbourne site. Based on the maximum observed queue at the four project sites, we conclude the proposed 32-vehicle queue storage is adequate to accommodate drive-through queues on-site without impact to nearby public roadway facilities[5]. *The results of the Queuing Study are provided in Appendix E.*

Delivery Truck Circulation

The proposed development is expected to generate 1 to 3 delivery trucks per day. Of these, one larger vehicle equal to or longer than a WB-50 is expected to deliver at night while smaller bread and produce delivery vehicles are expected during the day. *A WB-62 design vehicle truck circulation diagram is documented in the project civil engineering plans included in Appendix J.*

[4] While the designated drive through area accommodates 32 vehicles between the meal pick-up area and the back of the dedicated drive through lanes (prior to reaching the first on-site parking space), additional drive through storage is available on site within the parking drive aisle west of the drive through lane. Drive through queues up to an additional five vehicles can be accommodated in the southernmost lane approaching the drive-through entry without blocking additional drive aisles. The parking spaces along the west side of the drive aisle leading to the drive through entry are expected to be used as employee parking to minimize vehicle movements across the drive through entry lanes during periods of peak demand. Additional queue storage can be designated on site as needed through on-site temporary traffic management techniques.

[5] It should be noted that three of the four Portland area sites studied have a single drive through pickup window whereas the proposed site will have two active drive through lanes with pickup areas. Of the four sites studied, only the TV Highway site has the new two drive through lane configuration and it has both the lowest trip generation and the shortest drive through queues.

Findings and Recommendations

Based on the results of this report, the proposed Chick-fil-A can be constructed while maintaining acceptable operations at the study intersections. No capacity-based mitigation needs were identified.

Findings

- The study intersections were found to operate acceptably during the weekday AM and PM peak hours under existing and future conditions (without and with site development).
- The proposed restaurant will replace three existing single-family homes and includes the following proposed access changes:
  - Vacation of three existing site access driveways on W Baseline Street (OR-8), two existing site access driveways on N 4th Avenue, and one existing site access driveway on N Adair Street (OR-8);
  - Construction of one new site access driveway on W Baseline Street approximately 25 feet from the western end of the property line, maximizing the distance between the access and S 4th Avenue; and,
  - Construction of one new site access driveway on N Adair Street, directly north of the proposed site access on W Baseline Street and east of the existing Walmart access on the north side of N Adair Street.
- The proposed restaurant drive-through has two order and pick-up lines has been designed to accommodate the anticipated queue requirements on site without impacts to the public roadway network.
- Consistent with the City's Transportation System Plan and long-term vision for W Baseline Street and N Adair Street, no left-turn deceleration lanes are recommended at either site access point.

Recommendations

Subject to applicable City of Cornelius and ODOT concurrence, we recommend Chick-fil-A do the following in conjunction with the proposed restaurant:

- Reconstruct the site frontages along N Adair Street, N 4th Avenue, and W Baseline Street as determined through frontage improvement coordination with ODOT and City staff and consideration of the City's design and construction standards.
- Place new STOP (R1-1) signs for vehicles exiting the site at the new site access driveways onto N Adair Street and W Baseline Street in accordance with City and ODOT standards and the *Manual on Uniform Traffic Control Devices* (MUTCD).
- Place and maintain all vegetation and other above ground objects adjacent to the site access points to provide adequate minimum sight distance in accordance with the applicable City and ODOT requirements.

References

1. Transportation Research Board. *Highway Capacity Manual, 7th Edition*. 2022.
2. Oregon Department of Transportation. *Oregon Highway Plan*. 1999 Plan including updates through January 2023.
3. City of Cornelius. *2020 Cornelius Transportation System Plan*. Adopted June 1, 2020.
4. "Maps and Schedules". TriMet. https://trimet.org/schedules/index.htm
5. Oregon Department of Transportation. *Analysis Procedures Manual Version 2*. August 21, 2024 Update.
6. Institute of Transportation Engineers. *Trip Generation Manual, 11th Edition*. 2021.

Appendix

A. ODOT Crash Data
B. Traffic Counts
C. Existing Traffic Conditions Analysis Worksheets
D. 2026 Background Traffic Conditions Analysis Worksheets
E. Trip Generation/Queuing Study
F. Trip Assignment Summary Figures
G. 2026 Total Traffic Conditions Analysis Worksheets
H. Turn Lane Criteria Evaluation
I. Driveway Sight Distance Exhibit
J. Delivery Truck Circulation Exhibit

Appendix A:
ODOT Crash Data

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

ADAIR ST at N 4TH AVE, City of Cornelius, Washington County, 01/01/2018 to 12/31/2022

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2022														
ANGLE	0	2	0	2	0	3	0	2	0	1	1	2	0	0
PEDESTRIAN	0	1	0	1	0	1	0	0	1	0	1	1	0	0
REAR-END	0	1	0	1	0	1	0	1	0	1	0	1	0	0
TURNING MOVEMENTS	0	3	1	4	0	5	0	3	1	1	3	4	0	0
YEAR 2022 TOTAL	**0**	**7**	**1**	**8**	**0**	**10**	**0**	**6**	**2**	**3**	**5**	**8**	**0**	**0**
YEAR: 2021														
PEDESTRIAN	0	1	0	1	0	1	0	1	0	0	1	1	0	0
TURNING MOVEMENTS	0	1	0	1	0	2	0	1	0	0	1	1	0	0
YEAR 2021 TOTAL	**0**	**2**	**0**	**2**	**0**	**3**	**0**	**2**	**0**	**0**	**2**	**2**	**0**	**0**
YEAR: 2020														
ANGLE	0	2	1	3	0	2	0	2	1	3	0	3	0	0
REAR-END	0	1	0	1	0	1	0	1	0	0	1	1	0	0
TURNING MOVEMENTS	0	1	3	4	0	2	0	2	2	2	2	4	0	0
YEAR 2020 TOTAL	**0**	**4**	**4**	**8**	**0**	**5**	**0**	**5**	**3**	**5**	**3**	**8**	**0**	**0**
YEAR: 2019														
ANGLE	0	1	0	1	0	2	0	1	0	1	0	1	0	0
REAR-END	0	2	0	2	0	2	0	0	2	1	1	2	0	0
TURNING MOVEMENTS	0	2	1	3	0	2	0	2	1	2	1	3	0	0
YEAR 2019 TOTAL	**0**	**5**	**1**	**6**	**0**	**6**	**0**	**3**	**3**	**4**	**2**	**6**	**0**	**0**

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

ADAIR ST at N 4TH AVE, City of Cornelius, Washington County, 01/01/2018 to 12/31/2022

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2018														
ANGLE	0	1	0	1	0	1	0	1	0	1	0	1	0	0
FIXED / OTHER OBJECT	0	0	1	1	0	0	0	1	0	0	1	1	0	1
REAR-END	0	0	2	2	0	0	0	1	0	1	1	2	0	0
TURNING MOVEMENTS	0	0	2	2	0	0	0	2	0	2	0	2	0	0
YEAR 2018 TOTAL	**0**	**1**	**5**	**6**	**0**	**1**	**0**	**5**	**0**	**4**	**2**	**6**	**0**	**1**
FINAL TOTAL	**0**	**19**	**11**	**30**	**0**	**25**	**0**	**21**	**8**	**16**	**14**	**30**	**0**	**1**

Disclaimer: The information contained in this report is compiled from individual driver and police crash reports submitted to the Oregon Department of Transportation as required in ORS 811.720. The Crash Analysis and Reporting Unit is committed to providing the highest quality crash data to customers. However, because submittal of crash report forms is the responsibility of the individual driver, the Crash Analysis and Reporting Unit can not guarantee that all qualifying crashes are represented nor can assurances be made that all details pertaining to a single crash are accurate. Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

CITY OF CORNELIUS, WASHINGTON COUNTY

ADAIR ST at N 4TH AVE, City of Cornelius, Washington County, 01/01/2018 to 12/31/2022

1 - 5 of 30 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R U G	J N	I H	C R	S O L	W DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
06468	N	N	N	N				11/26/2018	14	N ADAIR ST	INTER	CROSS	N	N	UNK	S-1STOP	01	NONE 9	STRGHT										29
NONE								MO		N 4TH AVE	UN		TRF SIGNAL	N	UNK	REAR		N/A	UN-UN									000		00
N			4P								06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N			45 31 15.16		-123 4 .2					002900100S00															UNK					
																	02	NONE 9	STOP											
																		N/A	UN-UN									011		00
																		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																									UNK					
03551	N	N	N	N				07/07/2018	14	N ADAIR ST	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 9	STRGHT										29
NONE								SA		N 4TH AVE	E		TRF SIGNAL	N	DRY	REAR		N/A	E -W									000		00
N			10P								06	0		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N			45 31 15.16		-123 4 .19					002900100S00															UNK					
																	02	NONE 9	STOP											
																		N/A	E -W									011		00
																		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																									UNK					
03797	N	Y	Y	N				07/22/2018	14	N ADAIR ST	INTER	CROSS	N	Y	CLR	FIX OBJ	01	NONE 9	STRGHT										055	10
CITY								SU		N 4TH AVE	E		TRF SIGNAL	N	DRY	FIX		N/A	E -W									000		00
N			12A								06	0		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N			45 31 15.16		-123 4 .2					002900100S00															UNK					
00301	N	N	N	N	N	N		01/17/2019	14	N ADAIR ST	INTER	CROSS	N	N	RAIN	S-1STOP	01	NONE 0	STRGHT										013	07
CITY								TH		N 4TH AVE	E		TRF SIGNAL	N	WET	REAR		PRVTE	E -W									000		00
N			6P								06	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	INJB	23	F	OR-Y		043	000		07
N			45 31 15.16		-123 4 .2					002900100S00															OR<25					
																	02	NONE 0	STOP											
																		PRVTE	E -W									011	013	00
																		PSNGR CAR		01	DRVR	NONE	60	F	OR-Y		000	000		00
																									OR<25					
																	03	NONE 0	STOP											
																		PRVTE	E -W									022		00
																		PSNGR CAR		01	DRVR	NONE	66	F	OR-Y		000	000		00
																									OR<25					
00989	N	N	N	N				02/27/2019	14	N ADAIR ST	INTER	CROSS	N	N	SNOW	S-1STOP	01	NONE 0	STRGHT										124	29
NONE								WE		N 4TH AVE	E		TRF SIGNAL	N	ICE	REAR		PRVTE	E -W									000	124	00
N			7A								06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	47	M	OR-Y		026	000		29
N			45 31 15.15		-123 4 .19					002900100S00															OR<25					
																	02	NONE 0	STOP											
																		PRVTE	E -W									011		00
																		PSNGR CAR		01	DRVR	INJC	42	M	OR-Y		000	000		00
																									OR<25					

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CITY OF CORNELIUS, WASHINGTON COUNTY

ADAIR ST at N 4TH AVE, City of Cornelius, Washington County, 01/01/2018 to 12/31/2022

6 - 9 of 30 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R U G	J N S	I H V	C O R L	W DAY / TIME / LAT / LONG / LRS	CLASS / DIST / FROM / SECOND STREET / DIRECT / LOCTN	CITY STREET / FIRST STREET / RD CHAR / INTER / CROSS	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC / TYPE	INJ / SVRTY	A G E	S E X	LICNS / RES	PED LOC	ERROR	ACT	EVENT	CAUSE
04289	N	N	N	N			11/20/2020	14	N ADAIR ST	INTER	CROSS	N	N	FOG	01	NONE 0	STRGHT										013	29
CITY			FR						N 4TH AVE	E		TRF SIGNAL	N	DRY		PRVTE	E -W									000		00
N			6P							06	0		N	DUSK		PSNGR CAR		01	DRVR	NONE	41	F	OR-Y		026	000		29
N			45 31 15.15		-123 4 .2		002900100S00																	OR<25				
															02	NONE 0	STOP											
																PRVTE	E -W									011	013	00
																PSNGR CAR		01	DRVR	NONE	42	M	OR-Y		000	000		00
																							OR<25					
															03	NONE 0	STOP											
																PRVTE	E -W									011		00
																PSNGR CAR		01	DRVR	INJC	30	F	OR-Y		000	000		00
																							OR<25					
04902	N	N	N	N	N	N	10/21/2022	14	N ADAIR ST	INTER	CROSS	N	N	RAIN	01	NONE	TURN-R										115	27,14,15
CITY			FR						N 4TH AVE	E		TRF SIGNAL	N	WET		PRVTE	S -E									000		00
N			6P							05	0		N	DLIT		PSNGR CAR		01	DRVR	INJB	40	F	OR-Y		003,039	038	115	27,14,15
N			45 31 15.16		-123 4 .2		002900100S00																	OR<25				
															02	NONE	STRGHT											
																PRVTE	E -W									000		00
																PSNGR CAR		01	DRVR	INJC	37	F	OR-Y		000	000		00
																							OR<25					
05776	N	N	N	N			12/04/2022	14	N ADAIR ST	INTER	CROSS	N	N	CLR	01	NONE 0	STRGHT											27
NONE			SU						N 4TH AVE	E		TRF SIGNAL	N	DRY		PRVTE	E -W									000		00
N			7A							06	0		N	DAY		PSNGR CAR		01	DRVR	NONE	61	F	OR-Y		016,026	038		27
N			45 31 15.16		-123 4 .2		002900100S00																	OR<25				
															02	NONE 0	STOP											
																PRVTE	E -W									011		00
																PSNGR CAR		01	DRVR	INJB	53	F	OR-Y		000	000		00
																							OR<25					
01292	N	N	N	N	N	N	04/12/2021	14	N ADAIR ST	INTER	CROSS	N	N	CLR	01	NONE	STRGHT											04,18,28
CITY			MO						N 4TH AVE	W		TRF SIGNAL	N	DRY		PRVTE	E -W									000		00
N			7P							05	0		N	DUSK		PSNGR CAR		01	DRVR	NONE	31	F	OR-Y		000	000		00
N			45 31 15.16		-123 4 .2		002900100S00																	OR<25				
																	-											
																	STRGHT	01	PED	INJA	36	M		I XWLK	028,020	035		04,18,28
																	N S											
00276	N	N	N	N	N	N	01/18/2022	14	N ADAIR ST	INTER	CROSS	N	N	RAIN	01	NONE	TURN-R											02,19
CITY			TU						N 4TH AVE	W		TRF SIGNAL	N	WET		PRVTE	N -W									000		00
N			5P							05	0		N	DUSK		PSNGR CAR		01	DRVR	NONE	40	F	OR-Y		029	000		02
N			45 31 15.17		-123 4 .2		002900100S00																	OR>25				

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CITY OF CORNELIUS, WASHINGTON COUNTY

ADAIR ST at N 4TH AVE, City of Cornelius, Washington County, 01/01/2018 to 12/31/2022

10 - 15 of 30 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R U G S	J N S	S I H V	W C R L	O K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO / STRGHT - UN UN	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
																			- STRGHT	01	PED	INJA	64	F		I XWLK	000	000		19
05959	N	N	N	N	N	N		11/04/2018	14	N ADAIR ST	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										04
CITY				SU						N 4TH AVE	CN		TRF SIGNAL	N	DRY	ANGL		PRVTE	N -S								000		00
N				11A							01	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	43	F	OR-Y		020	000		04
N				45 31 15.16		-123 4 .2				002900100S00															OR<25					
																	02	NONE 0	STRGHT											
																		PRVTE	E -W								000		00
																		PSNGR CAR		01	DRVR	INJC	44	M	OR-Y		000	000		00
																									OR<25					
03340	N	N	N	N				06/29/2018	14	N ADAIR ST	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 9	TURN-L											02
NO RPT				FR						N 4TH AVE	CN		STOP SIGN	N	DRY	TURN		N/A	S -W								000		00
N				7P							04	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N				45 31 15.16		-123 4 .2				002900100S00															UNK					
																	02	NONE 9	STRGHT											
																		N/A	E -W								000		00
																		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																									UNK					
03862	N	N	N	N	N	N		07/26/2018	14	N ADAIR ST	INTER	CROSS	N	N	CLR	S-1TURN	01	NONE 9	STRGHT											08
CITY				TH						N 4TH AVE	CN		ONE-WAY	N	DRY	TURN		N/A	E -W								000		00
N				8P							03	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N				45 31 15.16		-123 4 .2				002900100S00															UNK					
																	02	NONE 9	TURN-L											
																		N/A	E -S								000		00
																		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																									UNK					
02049	N	N	N	N	N	N		04/25/2019	14	N ADAIR ST	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										093	27,04
CITY				TH						N 4TH AVE	CN		TRF SIGNAL	N	DRY	ANGL		PRVTE	E -W								000		00
N				2P							01	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	30	F	OR-Y		000	000		00
N				45 31 15.16		-123 4 .2				002900100S00															OR<25					
																	02	NONE 0	STRGHT											
																		PRVTE	N -S								000		00
																		PSNGR CAR		01	DRVR	INJC	70	F	OR-Y		016,020	038	093	27,04
																									OR<25					
03119	N	N	N	N	N	N		06/18/2019	14	N ADAIR ST	INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 0	TURN-L											02
CITY				TU						N 4TH AVE	CN		TRF SIGNAL	N	DRY	TURN		PRVTE	S -W								000		00
N				5P							03	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	17	M	OR-Y		028,004	000		02
N				45 31 15.16		-123 4 .2				002900100S00															OR<25					
																	02	NONE 0	STRGHT											
																		PRVTE	N -S								000		00
																		PSNGR CAR		01	DRVR	INJB	26	F	OR-Y		000	000		00
																									OR<25					

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CITY OF CORNELIUS, WASHINGTON COUNTY

ADAIR ST at N 4TH AVE, City of Cornelius, Washington County, 01/01/2018 to 12/31/2022

16 - 20 of 30 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R U G	J N S	S H V	W O R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT EVENT	CAUSE
05680	N	N	N	N			08/29/2019	14	N ADAIR ST	INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 0	STRGHT										02
NONE							TH		N 4TH AVE	CN		TRF SIGNAL	N	DRY	TURN		PRVTE	N -S									000	00
N							5P			03	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	65	M	OR-Y		000	000	00
N							45 31 15.16	-123 4 .2	002900100S00															OR<25				
																02	NONE 0	TURN-L										
																	PRVTE	S -W									000	00
																	PSNGR CAR		01	DRVR	NONE	22	F	OR-Y		000	000	00
																								OR<25				
																02	NONE 0	TURN-L										
																	PRVTE	S -W									000	00
																	PSNGR CAR		02	PSNG	INJC	22	F			000	000	00
05409	N	N	N	N	N	N	10/19/2019	14	N ADAIR ST	INTER	CROSS	N	N	CLD	ANGL-OTH	01	NONE 9	TURN-L										02
CITY							SA		N 4TH AVE	CN		TRF SIGNAL	N	WET	TURN		N/A	S -W									000	00
N							8P			04	0		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N							45 31 15.16	-123 4 .2	002900100S00															UNK				
																02	NONE 9	TURN-L										
																	N/A	E -S									000	00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
																								UNK				
01426	N	N	N	N	N	N	03/13/2020	14	N ADAIR ST	INTER	CROSS	N	N	CLD	ANGL-OTH	01	NONE 0	STRGHT										04
CITY							FR		N 4TH AVE	CN		TRF SIGNAL	N	WET	ANGL		PRVTE	E -W									000	00
N							11A			01	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	76	M	OR-Y		020	000	04
N							45 31 15.16	-123 4 .2	002900100S00															OR<25				
																02	NONE 0	STRGHT										
																	PRVTE	N -S									000	00
																	PSNGR CAR		01	DRVR	INJC	36	F	OR-Y		000	000	00
																								OR<25				
03132	N	Y	N	N	N	N	08/27/2020	14	N ADAIR ST	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										04
CITY							TH		N 4TH AVE	CN		TRF SIGNAL	N	DRY	ANGL		PRVTE	E -W									000	00
N							2P			01	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	35	M	OR-Y		020	000	04
N							45 31 15.16	-123 4 .2	002900100S00															OR<25				
																02	NONE 0	STRGHT										
																	PRVTE	S -N									000	00
																	PSNGR CAR		01	DRVR	INJB	33	M	OR-Y		000	000	00
																								OR<25				
04317	N	N	N	N	N	N	11/22/2020	14	N ADAIR ST	INTER	CROSS	N	N	RAIN	O-1 L-TURN	01	NONE 0	STRGHT										02,04
CITY							SU		N 4TH AVE	CN		TRF SIGNAL	N	WET	TURN		PRVTE	N -S									000	00
N							7P			01	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	INJC	17	F	OR-Y		000	000	00
N							45 31 15.16	-123 4 .22	002900100S00															OR<25				
																02	NONE 0	TURN-L										
																	PRVTE	S -W									000	00
																	PSNGR CAR		01	DRVR	INJC	18	F	OR-Y		028,004,020	000	02,04
																								OR<25				

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SER# / INVEST / RD DPT / UNLOC?	S P E D	D E A C	M R U G	J I N S	S C H V	W O R L	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC / INJ / SVRTY	A G E	S E X	LICNS / RES	PED LOC	ERROR	ACT	EVENT	CAUSE
01658	N	N	N	N			04/16/2020	14	N ADAIR ST	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 9	STRGHT										02,04
NO RPT							TH		N 4TH AVE	CN		TRF SIGNAL	N	DRY	ANGL		N/A	S -N								000		00
N							12P			02	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N							45 31 15.16	-123 4 .2	002900100S00															UNK				
																02	NONE 9	STRGHT										
																	N/A	E -W								000		00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
																								UNK				
02899	N	N	N	N	N	N	08/12/2020	14	N ADAIR ST	INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 9	STRGHT										02,04
CITY							WE		N 4TH AVE	CN		TRF SIGNAL	N	DRY	TURN		N/A	S -N								000		00
N							9P			04	0		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N							45 31 15.17	-123 4 .19	002900100S00															UNK				
																02	NONE 9	TURN-L										
																	N/A	N -E								000		00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
																								UNK				
02132	N	N	N	N	N	N	06/09/2020	14	N ADAIR ST	INTER	CROSS	N	N	CLD	ANGL-OTH	01	NONE 9	TURN-R										02
CITY							TU		N 4TH AVE	CN		TRF SIGNAL	N	WET	TURN		N/A	E -N								000		00
N							11A			02	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N							45 31 15.16	-123 4 .2	002900100S00															UNK				
																02	NONE 9	STRGHT										
																	N/A	S -N								000		00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
																								UNK				
02032	N	N	N	N	N	N	06/04/2020	14	N ADAIR ST	INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 9	STRGHT										32,04
CITY							TH		N 4TH AVE	CN		TRF SIGNAL	N	DRY	TURN		N/A	N -S								088		00
N							3P			01	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N							45 31 15.18	-123 4 .2	002900100S00															UNK				
																02	NONE 9	TURN-L										
																	N/A	S -W								000		00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
																								UNK				
03374	N	N	N	N			08/19/2021	14	N ADAIR ST	INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 0	STRGHT										02,27
CITY							TH		N 4TH AVE	CN		TRF SIGNAL	N	DRY	TURN		PRVTE	N -S								000		00
N							10P			01	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	INJC	54	M	OR-Y		000	000	00
N							45 31 15.16	-123 4 .2	002900100S00															OR<25				
																01	NONE 0	STRGHT										
																	PRVTE	N -S								000		00
																	PSNGR CAR		02	PSNG	INJC	61	F			000	000	00
																02	NONE 0	TURN-L										
																	PRVTE	S -W								000		00
																	PSNGR CAR		01	DRVR	NONE	20	F	OR-Y		016,028	038	02,27
																								OR<25				

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CITY OF CORNELIUS, WASHINGTON COUNTY

ADAIR ST at N 4TH AVE, City of Cornelius, Washington County, 01/01/2018 to 12/31/2022

26 - 30 of 30 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R U G	J N S	S I H V	W C O R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC / TYPE	INJ / SVRTY	A G E	S E X	LICNS / RES	PED / LOC	ERROR	ACT	EVENT	CAUSE
00323	N	N	N	N	N	N	01/22/2022	14	N ADAIR ST	INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE	TURN-L										08,02
CITY			SA						N 4TH AVE	CN		TRF SIGNAL	N	DRY	TURN		PRVTE	S -W									000	00
N			6P							03	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	18	F	NONE		004,028	000	08,02
N			45 31 15.17		-123 4 .2		002900100S00																	OR<25				
																02	NONE	STRGHT										
																	PRVTE	N -S									000	00
																	PSNGR CAR		01	DRVR	INJB	26	M	OR-Y		000	000	00
																								OR<25				
																02	NONE	STRGHT										
																	PRVTE	N -S									000	00
																	PSNGR CAR		02	PSNG	INJB	27	F			000	000	00
02261	N	N	N	N	N	N	05/21/2022	14	N ADAIR ST	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT											04
CITY			SA						N 4TH AVE	CN		TRF SIGNAL	N	DRY	ANGL		PRVTE	S -N									000	00
N			11A							02	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJB	36	M	SUSP		020	000	04
N			45 31 15.16		-123 4 .2		002900100S00																	OR<25				
																02	NONE 0	STRGHT										
																	PRVTE	E -W									000	00
																	PSNGR CAR		01	DRVR	INJC	32	M	OR-Y		000	000	00
																								OR<25				
04581	N	N	N	N	N	N	10/05/2022	14	N ADAIR ST	INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE	STRGHT										27,08,02
CITY			WE						N 4TH AVE	CN		TRF SIGNAL	N	DRY	TURN		PRVTE	N -S									000	00
N			6P							03	0		N	DUSK	INJ		PSNGR CAR		01	DRVR	NONE	70	F	OR-Y		000	000	00
N			45 31 15.16		-123 4 .2		002900100S00																	OR<25				
																02	NONE	TURN-L										
																	PRVTE	S -W									000	00
																	PSNGR CAR		01	DRVR	INJC	16	F	OR-Y		004,028	038	27,08,02
																								OR<25				
02163	N	N	N	N	N	N	05/16/2022	14	N ADAIR ST	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 9	TURN-L										32,02
CITY			MO						N 4TH AVE	CN		TRF SIGNAL	N	DRY	TURN		N/A	S -W									016	00
N			5P							03	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N			45 31 15.16		-123 4 .2		002900100S00																	UNK				
																02	NONE 9	STRGHT										
																	N/A	E -W									000	00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
																								UNK				
05872	N	N	N	N	N	N	12/10/2022	14	N ADAIR ST	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										04
CITY			SA						N 4TH AVE	CN		TRF SIGNAL	N	DRY	ANGL		PRVTE	E -W									000	00
N			7P							02	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	INJC	24	M	OR-Y		097	000	00
N			45 31 15.16		-123 4 .2		002900100S00																	OR<25				
																02	NONE 0	STRGHT										
																	PRVTE	S -N									000	00
																	PSNGR CAR		01	DRVR	NONE	28	M	OR-Y		097	000	00
																								OR<25				

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CRASH SUMMARIES BY YEAR BY COLLISION TYPE

BASELINE ST at N 4TH AVE, City of Cornelius, Washington County, 01/01/2018 to 12/31/2022

COLLISION TYPE	FATAL CRASHES	MAJOR INJURY CRASHES	MODERATE INJURY CRASHES	MINOR INJURY CRASHES	PROP DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	MAJOR INJURIES	MODERATE INJURIES	MINOR INJURIES
YEAR: 2022										
REAR-END	0	0	0	0	1	1	0	0	0	0
2022 TOTAL	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**
YEAR: 2021										
ANGLE	0	0	1	0	0	1	0	0	1	2
REAR-END	0	0	1	0	0	1	0	0	2	0
2021 TOTAL	**0**	**0**	**2**	**0**	**0**	**2**	**0**	**0**	**3**	**2**
YEAR: 2020										
ANGLE	0	0	0	1	0	1	0	0	0	3
2020 TOTAL	**0**	**0**	**0**	**1**	**0**	**1**	**0**	**0**	**0**	**3**
FINAL TOTAL	**0**	**0**	**2**	**1**	**1**	**4**	**0**	**0**	**3**	**5**

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CITY OF CORNELIUS, WASHINGTON COUNTY

BASELINE ST at N 4TH AVE, City of Cornelius, Washington County, 01/01/2018 to 12/31/2022

1 - 4 of 4 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R U G S	J N S	I H V	C O L	W R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / TYPE / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
04086	N	N	N	N	N	N	N	09/09/2022	17	E BASELINE ST	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 9	STRGHT										07,29
CITY								FR	0	N 4TH AVE	N		TRF SIGNAL	N	DRY	REAR		N/A	N -S								000		00
N								9A			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N								45 31 12.3	-123 4 .24																UNK					
																	02	NONE 9	STOP											
																		N/A	N -S									012		00
																		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																									UNK					
05453	N	N	N	N				12/09/2021	14	E BASELINE ST	INTER	CROSS	N	N	CLD	S-1STOP	01	NONE 0	STRGHT										29
NONE								TH		N 4TH AVE	W		TRF SIGNAL	N	WET	REAR		PRVTE	W -E								000		00
N								11A			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	33	M	OR-Y		026	000		29
N								45 31 12.3	-123 4 .24	002900200S00															OR<25					
																	02	NONE 0	STOP											
																		PRVTE	W -E									011		00
																		PSNGR CAR		01	DRVR	INJB	78	M	OR-Y		000	000		00
																									OR<25					
																	02	NONE 0	STOP											
																		PRVTE	W -E									011		00
																		PSNGR CAR		02	PSNG	INJB	68	F			000	000		00
02624	N	N	N	N	N	N		07/22/2020	14	E BASELINE ST	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										04
CITY								WE		N 4TH AVE	CN		TRF SIGNAL	N	DRY	ANGL		PRVTE	N -S								000		00
N								5A			04	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	36	M	EXP		020	000		04
N								45 31 12.3	-123 4 .24	002900200S00															N-RES					
																	02	NONE 0	STRGHT											
																		PRVTE	W -E									000		00
																		PSNGR CAR		01	DRVR	INJC	33	M	OR-Y		000	000		00
																									OR<25					
																	03	NONE 0	STRGHT											
																		PRVTE	W -E									022		00
																		PSNGR CAR		01	DRVR	INJC	36	M	OR-Y		000	000		00
																									OR<25					
00170	N	N	N	N	N	N		04/14/2021	14	E BASELINE ST	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE	STRGHT										04,10,27
CITY								WE		N 4TH AVE	CN		TRF SIGNAL	N	DRY	ANGL		PRVTE	S -N								000		00
N								2P			04	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	43	F	OR-Y		000	000		00
N								45 31 12.3	-123 4 .25	002900200S00															OR<25					
																	01	NONE	STRGHT											
																		PRVTE	S -N									000		00
																		PSNGR CAR		02	PSNG	INJC	26	F			000	000		00
																	02	NONE	STRGHT											
																		PRVTE	W -E									000		00
																		PSNGR CAR		01	DRVR	INJB	70	F	OR-Y		020	038		04,10,27
																									OR<25					

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CRASH SUMMARIES BY YEAR BY COLLISION TYPE

BASELINE ST at S 4TH AVE, City of Cornelius, Washington County, 01/01/2018 to 12/31/2022

COLLISION TYPE	FATAL CRASHES	MAJOR INJURY CRASHES	MODERATE INJURY CRASHES	MINOR INJURY CRASHES	PROP DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	MAJOR INJURIES	MODERATE INJURIES	MINOR INJURIES
YEAR: 2022										
REAR-END	0	0	0	2	0	2	0	0	0	4
TURNING MOVEMENTS	0	0	1	0	0	1	0	0	3	0
2022 TOTAL	**0**	**0**	**1**	**2**	**0**	**3**	**0**	**0**	**3**	**4**
YEAR: 2020										
ANGLE	0	0	0	1	0	1	0	0	0	1
TURNING MOVEMENTS	0	0	0	1	1	2	0	0	0	2
2020 TOTAL	**0**	**0**	**0**	**2**	**1**	**3**	**0**	**0**	**0**	**3**
YEAR: 2019										
TURNING MOVEMENTS	0	1	0	0	0	1	0	1	0	1
2019 TOTAL	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**1**	**0**	**1**
YEAR: 2018										
ANGLE	0	0	0	1	0	1	0	0	0	1
TURNING MOVEMENTS	0	0	0	1	0	1	0	0	0	1
2018 TOTAL	**0**	**0**	**0**	**2**	**0**	**2**	**0**	**0**	**0**	**2**
FINAL TOTAL	**0**	**1**	**1**	**6**	**1**	**9**	**0**	**1**	**3**	**10**

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CITY OF CORNELIUS, WASHINGTON COUNTY

S 4TH AVE at BASELINE ST, City of Cornelius, Washington County, 01/01/2018 to 12/31/2022

1 - 4 of 9 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R U G S	J N S	I H V	C O R L	W DAY / TIME / LAT	DATE / CLASS / CITY STREET / INT-TYPE	DIST / FROM / SECOND STREET / DIRECT / LEGS / LRS	LONG	RD CHAR / LOCTN	(MEDIAN) / (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC / TYPE	INJ / SVRTY	A G E	S E X	LICNS / RES	PED LOC	ERROR	ACT	EVENT	CAUSE
03385	N	N	N	N			07/01/2018	14	E BASELINE ST		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT											02,08,13
NO RPT			SU						S 4TH AVE		E		TRF SIGNAL	N	DRY	TURN		PRVTE	W -E									000		00
N			12P								06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	51	M	OR-Y		000	000		00
N			45 31 12.3		-123 4 .24				002900200S00																OR>25					
																	02	NONE 0	TURN-R											
																		PRVTE	S -E									016		00
																		PSNGR CAR		01	DRVR	INJC	26	F	OR-Y		028,007,045	000		02,08,13
																									OR<25					
03296	N	N	N	N			06/19/2022	17	E BASELINE ST		INTER	CROSS	N	N	UNK	S-1STOP	01	NONE	STRGHT											29,10
CITY			SU		0				S 4TH AVE		S		TRF SIGNAL	N	UNK	REAR		PRVTE	S -N									000		00
N			6A								06	0		N	DAWN	INJ		PSNGR CAR		01	DRVR	NONE	50	M	SUSP		026	017		29,10
N			45 31 12.3		-123 4 .24																				OR<25					
																	02	NONE	STOP											
																		PRVTE	S -N									011		00
																		PSNGR CAR		01	DRVR	INJC	49	F	OR-Y		000	000		00
																									OR<25					
																	02	NONE	STOP											
																		PRVTE	S -N									011		00
																		PSNGR CAR		02	PSNG	INJC	34	F			000	000		00
02185	N	N	N	N			05/17/2022	14	E BASELINE ST		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											29
NONE			TU						S 4TH AVE		W		TRF SIGNAL	N	DRY	REAR		PRVTE	W -E									000		00
N			3P								06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	55	M	OR-Y		026	000		29
N			45 31 12.3		-123 4 .24				002900200S00																OR<25					
																	02	NONE 0	STOP											
																		PRVTE	W -E									011		00
																		PSNGR CAR		01	DRVR	INJC	69	F	OR-Y		000	000		00
																									OR<25					
																	02	NONE 0	STOP											
																		PRVTE	W -E									011		00
																		PSNGR CAR		02	PSNG	INJC	74	M			000	000		00
03454	N	N	N	N			07/05/2018	14	E BASELINE ST		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										108	14
CITY			TH						S 4TH AVE		CN		TRF SIGNAL	N	DRY	ANGL		PRVTE	W -E									000		00
N			11P								03	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	INJC	45	F	OR-Y		023	000		14
N			45 31 12.3		-123 4 .24				002900200S00																OR<25					
																	02	POLCE 0	STRGHT											
																		PUBLC	N -S									000		00
																		PSNGR CAR		01	DRVR	NONE	36	M	OR-Y		000	000	108	00
																									OR<25					
01146	N	N	N	N			03/05/2019	14	E BASELINE ST		INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 0	TURN-L											02
NO RPT			TU						S 4TH AVE		CN		TRF SIGNAL	N	DRY	TURN		PRVTE	N -E									000		00
N			12P								04	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	33	F	OR-Y		028,004	000		02
N			45 31 12.3		-123 4 .24				002900200S00																OR<25					

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SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R U G S	J N S	I H V	C O R K	W DAY / TIME / LAT	DATE / DIST / FROM / LONG	CLASS / FIRST STREET / SECOND STREET / LRS	CITY STREET / RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
																02	NONE 0	STRGHT										
																	PRVTE	S -N									000	00
																	PSNGR CAR		01	DRVR	NONE	52	M	OR-Y		000	000	00
																								OR<25				
																02	NONE 0	STRGHT										
																	PRVTE	S -N									000	00
																	PSNGR CAR		02	PSNG	INJA	49	F			000	000	00
00988	N	N	N	N	N	N	02/18/2020	14	E BASELINE ST	INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 0	TURN-L										02
CITY			TU						S 4TH AVE	CN		TRF SIGNAL	N	DRY	TURN		PRVTE	N -E								000	00
N			3A							04	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	54	M	NONE		028,004	000	02
N			45 31 12.3		-123 4 .24		002900200S00																	OR<25				
																02	NONE 0	STRGHT										
																	PRVTE	S -N									000	00
																	PSNGR CAR		01	DRVR	INJC	25	F	SUSP		000	000	00
																								OR<25				
																02	NONE 0	STRGHT										
																	PRVTE	S -N									000	00
																	PSNGR CAR		02	PSNG	INJC	46	M			000	000	00
04465	N	N	N	N	N	N	12/04/2020	14	E BASELINE ST	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										32,04
NO RPT			FR						S 4TH AVE	CN		TRF SIGNAL	N	DRY	ANGL		PRVTE	W -E								000	00
N			12P							04	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	49	M	OR-Y		052,020	000	32,04
N			45 31 12.3		-123 4 .24		002900200S00																	OR<25				
																02	NONE 0	STRGHT										
																	PRVTE	S -N									000	00
																	PSNGR CAR		01	DRVR	NONE	63	M	OR-Y		000	000	00
																								OR<25				
01451	N	N	N	N	N	N	03/15/2020	14	E BASELINE ST	INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 9	TURN-L										02
CITY			SU						S 4TH AVE	CN		TRF SIGNAL	N	DRY	TURN		N/A	N -E								000	00
N			10P							04	0		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N			45 31 12.3		-123 4 .24		002900200S00																	UNK				
																02	NONE 9	STRGHT										
																	N/A	S -N									000	00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
																								UNK				
05592	N	N	N	N	N	N	11/25/2022	14	E BASELINE ST	INTER	CROSS	N	N	RAIN	O-1 L-TURN	01	NONE 0	STRGHT										02,04
CITY			FR						S 4TH AVE	CN		TRF SIGNAL	N	WET	TURN		PRVTE	S -N								000	00
N			4P							04	0		N	DUSK	INJ		PSNGR CAR		01	DRVR	INJB	51	F	OR-Y		000	000	00
N			45 31 12.3		-123 4 .24		002900200S00																	OR<25				
																02	NONE 0	TURN-L										
																	PRVTE	N -E									000	00
																	PSNGR CAR		01	DRVR	INJB	17	M	OR-Y		028,004,020	000	02,04
																								OR<25				

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SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R U G S	J I N V	S C H L	W O R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	SPCL USE / TRLR QTY / OWNER / V# / TYPE	MOVE / FROM / TO / P# / TYPE	PRTC / INJ / SVRTY	A G E	S E X	LICNS / RES	PED / LOC	ERROR	ACT	EVENT	CAUSE
																02 NONE 0	TURN-L								
																PRVTE	N -E							000	00
																PSNGR CAR	02 PSNG	INJB	20	F			000	000	00

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ACTION CODE TRANSLATION LIST

ACTION CODE	SHORT DESCRIPTION	LONG DESCRIPTION
000	NONE	NO ACTION OR NON-WARRANTED
001	SKIDDED	SKIDDED
002	ON/OFF V	GETTING ON OR OFF STOPPED OR PARKED VEHICLE
003	LOAD OVR	OVERHANGING LOAD STRUCK ANOTHER VEHICLE, ETC.
006	SLOW DN	SLOWED DOWN
007	AVOIDING	AVOIDING MANEUVER
008	PAR PARK	PARALLEL PARKING
009	ANG PARK	ANGLE PARKING
010	INTERFERE	PASSENGER INTERFERING WITH DRIVER
011	STOPPED	STOPPED IN TRAFFIC NOT WAITING TO MAKE A LEFT TURN
012	STP/L TRN	STOPPED BECAUSE OF LEFT TURN SIGNAL OR WAITING, ETC.
013	STP TURN	STOPPED WHILE EXECUTING A TURN
014	EMR V PKD	EMERGENCY VEHICLE LEGALLY PARKED IN THE ROADWAY
015	GO A/STOP	PROCEED AFTER STOPPING FOR A STOP SIGN/FLASHING RED.
016	TRN A/RED	TURNED ON RED AFTER STOPPING
017	LOSTCTRL	LOST CONTROL OF VEHICLE
018	EXIT DWY	ENTERING STREET OR HIGHWAY FROM ALLEY OR DRIVEWAY
019	ENTR DWY	ENTERING ALLEY OR DRIVEWAY FROM STREET OR HIGHWAY
020	STR ENTR	BEFORE ENTERING ROADWAY, STRUCK PEDESTRIAN, ETC. ON SIDEWALK OR SHOULDER
021	NO DRVR	CAR RAN AWAY - NO DRIVER
022	PREV COL	STRUCK, OR WAS STRUCK BY, VEHICLE OR PEDESTRIAN IN PRIOR COLLISION BEFORE ACC. STABILIZED
023	STALLED	VEHICLE STALLED OR DISABLED
024	DRVR DEAD	DEAD BY UNASSOCIATED CAUSE
025	FATIGUE	FATIGUED, SLEEPY, ASLEEP
026	SUN	DRIVER BLINDED BY SUN
027	HDLGHTS	DRIVER BLINDED BY HEADLIGHTS
028	ILLNESS	PHYSICALLY ILL
029	THRU MED	VEHICLE CROSSED, PLUNGED OVER, OR THROUGH MEDIAN BARRIER
030	PURSUIT	PURSUING OR ATTEMPTING TO STOP A VEHICLE
031	PASSING	PASSING SITUATION
032	PRKOFFRD	VEHICLE PARKED BEYOND CURB OR SHOULDER
033	CROS MED	VEHICLE CROSSED EARTH OR GRASS MEDIAN
034	X N/SGNL	CROSSING AT INTERSECTION - NO TRAFFIC SIGNAL PRESENT
035	X W/ SGNL	CROSSING AT INTERSECTION - TRAFFIC SIGNAL PRESENT
036	DIAGONAL	CROSSING AT INTERSECTION - DIAGONALLY
037	BTWN INT	CROSSING BETWEEN INTERSECTIONS
038	DISTRACT	DRIVER'S ATTENTION DISTRACTED
039	W/TRAF-S	WALKING, RUNNING, RIDING, ETC., ON SHOULDER WITH TRAFFIC
040	A/TRAF-S	WALKING, RUNNING, RIDING, ETC., ON SHOULDER FACING TRAFFIC
041	W/TRAF-P	WALKING, RUNNING, RIDING, ETC., ON PAVEMENT WITH TRAFFIC
042	A/TRAF-P	WALKING, RUNNING, RIDING, ETC., ON PAVEMENT FACING TRAFFIC
043	PLAYINRD	PLAYING IN STREET OR ROAD
044	PUSH MV	PUSHING OR WORKING ON VEHICLE IN ROAD OR ON SHOULDER
045	WORK ON	WORKING IN ROADWAY OR ALONG SHOULDER
046	W/ TRAFIC	NON-MOTORIST WALKING, RUNNING, RIDING, ETC. WITH TRAFFIC
047	A/ TRAFIC	NON-MOTORIST WALKING, RUNNING, RIDING, ETC. FACING TRAFFIC
050	LAY ON RD	STANDING OR LYING IN ROADWAY
051	ENT OFFRD	ENTERING / STARTING IN TRAFFIC LANE FROM OFF ROAD
052	MERGING	MERGING

ACTION CODE TRANSLATION LIST

ACTION CODE	SHORT DESCRIPTION	LONG DESCRIPTION
055	SPRAY	BLINDED BY WATER SPRAY
088	OTHER	OTHER ACTION
099	UNK	UNKNOWN ACTION

CAUSE CODE TRANSLATION LIST

CAUSE CODE	SHORT DESCRIPTION	LONG DESCRIPTION
00	NO CODE	NO CAUSE ASSOCIATED AT THIS LEVEL
01	TOO-FAST	TOO FAST FOR CONDITIONS (NOT EXCEED POSTED SPEED
02	NO-YIELD	DID NOT YIELD RIGHT-OF-WAY
03	PAS-STOP	PASSED STOP SIGN OR RED FLASHER
04	DIS SIG	DISREGARDED TRAFFIC SIGNAL
05	LEFT-CTR	DROVE LEFT OF CENTER ON TWO-WAY ROAD; STRADDLING
06	IMP-OVER	IMPROPER OVERTAKING
07	TOO-CLOS	FOLLOWED TOO CLOSELY
08	IMP-TURN	MADE IMPROPER TURN
09	DRINKING	ALCOHOL OR DRUG INVOLVED
10	OTHR-IMP	OTHER IMPROPER DRIVING
11	MECH-DEF	MECHANICAL DEFECT
12	OTHER	OTHER (NOT IMPROPER DRIVING)
13	IMP LN C	IMPROPER CHANGE OF TRAFFIC LANES
14	DIS TCD	DISREGARDED OTHER TRAFFIC CONTROL DEVICE
15	WRNG WAY	WRONG WAY ON ONE-WAY ROAD; WRONG SIDE DIVIDED RO
16	FATIGUE	DRIVER DROWSY/FATIGUED/SLEEPY
17	ILLNESS	PHYSICAL ILLNESS
18	IN RDWY	NON-MOTORIST ILLEGALLY IN ROADWAY
19	NT VISBL	NON-MOTORIST NOT VISIBLE; NON-REFLECTIVE CLOTHIN
20	IMP PKNG	VEHICLE IMPROPERLY PARKED
21	DEF STER	DEFECTIVE STEERING MECHANISM
22	DEF BRKE	INADEQUATE OR NO BRAKES
24	LOADSHFT	VEHICLE LOST LOAD OR LOAD SHIFTED
25	TIREFAIL	TIRE FAILURE
26	PHANTOM	PHANTOM / NON-CONTACT VEHICLE
27	INATTENT	INATTENTION
28	NM INATT	NON-MOTORIST INATTENTION
29	F AVOID	FAILED TO AVOID VEHICLE AHEAD
30	SPEED	DRIVING IN EXCESS OF POSTED SPEED
31	RACING	SPEED RACING (PER PAR)
32	CARELESS	CARELESS DRIVING (PER PAR)
33	RECKLESS	RECKLESS DRIVING (PER PAR)
34	AGGRESV	AGGRESSIVE DRIVING (PER PAR)
35	RD RAGE	ROAD RAGE (PER PAR)
40	VIEW OBS	VIEW OBSCURED
50	USED MDN	IMPROPER USE OF MEDIAN OR SHOULDER
51	FAIL LN	FAILED TO MAINTAIN LANE
52	OFF RD	RAN OFF ROAD

COLLISION TYPE CODE TRANSLATION LIST

COLL CODE	SHORT DESCRIPTION	LONG DESCRIPTION
&	OTH	MISCELLANEOUS
-	BACK	BACKING
0	PED	PEDESTRIAN
1	ANGL	ANGLE
2	HEAD	HEAD-ON
3	REAR	REAR-END
4	SS-M	SIDESWIPE - MEETING
5	SS-O	SIDESWIPE - OVERTAKING
6	TURN	TURNING MOVEMENT
7	PARK	PARKING MANEUVER
8	NCOL	NON-COLLISION
9	FIX	FIXED OBJECT OR OTHER OBJECT

CRASH TYPE CODE TRANSLATION LIST

CRASH TYPE	SHORT DESCRIPTION	LONG DESCRIPTION
&	OVERTURN	OVERTURNED
0	NON-COLL	OTHER NON-COLLISION
1	OTH RDWY	MOTOR VEHICLE ON OTHER ROADWAY
2	PRKD MV	PARKED MOTOR VEHICLE
3	PED	PEDESTRIAN
4	TRAIN	RAILWAY TRAIN
6	BIKE	PEDALCYCLIST
7	ANIMAL	ANIMAL
8	FIX OBJ	FIXED OBJECT
9	OTH OBJ	OTHER OBJECT
A	ANGL-STP	ENTERING AT ANGLE - ONE VEHICLE STOPPED
B	ANGL-OTH	ENTERING AT ANGLE - ALL OTHERS
C	S-STRGHT	FROM SAME DIRECTION - BOTH GOING STRAIGHT
D	S-1TURN	FROM SAME DIRECTION - ONE TURN, ONE STRAIGHT
E	S-1STOP	FROM SAME DIRECTION - ONE STOPPED
F	S-OTHER	FROM SAME DIRECTION-ALL OTHERS, INCLUDING PARKING
G	O-STRGHT	FROM OPPOSITE DIRECTION - BOTH GOING STRAIGHT
H	O-1 L-TURN	FROM OPPOSITE DIRECTION-ONE LEFT TURN,ONE STRAIGHT
I	O-1STOP	FROM OPPOSITE DIRECTION - ONE STOPPED
J	O-OTHER	FROM OPPOSITE DIRECTION-ALL OTHERS INCL. PARKING

DRIVER LICENSE CODE TRANSLATION LIST

LIC CODE	SHORT DESC	LONG DESCRIPTION
0	NONE	NOT LICENSED (HAD NEVER BEEN LICENSED)
1	OR-Y	VALID OREGON LICENSE
2	OTH-Y	VALID LICENSE, OTHER STATE OR COUNTRY
3	SUSP	SUSPENDED/REVOKED
4	EXP	EXPIRED
8	N-VAL	OTHER NON-VALID LICENSE
9	UNK	UNKNOWN IF DRIVER WAS LICENSED AT TIME OF CRASH

DRIVER RESIDENCE CODE TRANSLATION LIST

RES CODE	SHORT DESC	LONG DESCRIPTION
1	OR<25	OREGON RESIDENT WITHIN 25 MILE OF HOME
2	OR>25	OREGON RESIDENT 25 OR MORE MILES FROM HOME
3	OR-?	OREGON RESIDENT - UNKNOWN DISTANCE FROM HOME
4	N-RES	NON-RESIDENT
9	UNK	UNKNOWN IF OREGON RESIDENT

ERROR CODE TRANSLATION LIST

ERROR CODE	SHORT DESCRIPTION	FULL DESCRIPTION
000	NONE	NO ERROR
001	WIDE TRN	WIDE TURN
002	CUT CORN	CUT CORNER ON TURN
003	FAIL TRN	FAILED TO OBEY MANDATORY TRAFFIC TURN SIGNAL, SIGN OR LANE MARKINGS
004	L IN TRF	LEFT TURN IN FRONT OF ONCOMING TRAFFIC
005	L PROHIB	LEFT TURN WHERE PROHIBITED
006	FRM WRNG	TURNED FROM WRONG LANE
007	TO WRONG	TURNED INTO WRONG LANE
008	ILLEG U	U-TURNED ILLEGALLY
009	IMP STOP	IMPROPERLY STOPPED IN TRAFFIC LANE
010	IMP SIG	IMPROPER SIGNAL OR FAILURE TO SIGNAL
011	IMP BACK	BACKING IMPROPERLY (NOT PARKING)
012	IMP PARK	IMPROPERLY PARKED
013	UNPARK	IMPROPER START LEAVING PARKED POSITION
014	IMP STRT	IMPROPER START FROM STOPPED POSITION
015	IMP LGHT	IMPROPER OR NO LIGHTS (VEHICLE IN TRAFFIC)
016	INATTENT	INATTENTION (FAILURE TO DIM LIGHTS PRIOR TO 4/1/97)
017	UNSF VEH	DRIVING UNSAFE VEHICLE (NO OTHER ERROR APPARENT)
018	OTH PARK	ENTERING/EXITING PARKED POSITION W/ INSUFFICIENT CLEARANCE; OTHER IMPROPER PARKING MANEUVER
019	DIS DRIV	DISREGARDED OTHER DRIVER'S SIGNAL
020	DIS SGNL	DISREGARDED TRAFFIC SIGNAL
021	RAN STOP	DISREGARDED STOP SIGN OR FLASHING RED
022	DIS SIGN	DISREGARDED WARNING SIGN, FLARES OR FLASHING AMBER
023	DIS OFCR	DISREGARDED POLICE OFFICER OR FLAGMAN
024	DIS EMER	DISREGARDED SIREN OR WARNING OF EMERGENCY VEHICLE
025	DIS RR	DISREGARDED RR SIGNAL, RR SIGN, OR RR FLAGMAN
026	REAR-END	FAILED TO AVOID STOPPED OR PARKED VEHICLE AHEAD OTHER THAN SCHOOL BUS
027	BIKE ROW	DID NOT HAVE RIGHT-OF-WAY OVER PEDALCYCLIST
028	NO ROW	DID NOT HAVE RIGHT-OF-WAY
029	PED ROW	FAILED TO YIELD RIGHT-OF-WAY TO PEDESTRIAN
030	PAS CURV	PASSING ON A CURVE
031	PAS WRNG	PASSING ON THE WRONG SIDE
032	PAS TANG	PASSING ON STRAIGHT ROAD UNDER UNSAFE CONDITIONS
033	PAS X-WK	PASSED VEHICLE STOPPED AT CROSSWALK FOR PEDESTRIAN
034	PAS INTR	PASSING AT INTERSECTION
035	PAS HILL	PASSING ON CREST OF HILL
036	N/PAS ZN	PASSING IN "NO PASSING" ZONE
037	PAS TRAF	PASSING IN FRONT OF ONCOMING TRAFFIC
038	CUT-IN	CUTTING IN (TWO LANES - TWO WAY ONLY)
039	WRNGSIDE	DRIVING ON WRONG SIDE OF THE ROAD (2-WAY UNDIVIDED ROADWAYS)

ERROR CODE TRANSLATION LIST

ERROR CODE	SHORT DESCRIPTION	FULL DESCRIPTION
040	THRU MED	DRIVING THROUGH SAFETY ZONE OR OVER ISLAND
041	F/ST BUS	FAILED TO STOP FOR SCHOOL BUS
042	F/SLO MV	FAILED TO DECREASE SPEED FOR SLOWER MOVING VEHICLE
043	TOO CLOSE	FOLLOWING TOO CLOSELY (MUST BE ON OFFICER'S REPORT)
044	STRDL LN	STRADDLING OR DRIVING ON WRONG LANES
045	IMP CHG	IMPROPER CHANGE OF TRAFFIC LANES
046	WRNG WAY	WRONG WAY ON ONE-WAY ROADWAY; WRONG SIDE DIVIDED ROAD
047	BASCRULE	DRIVING TOO FAST FOR CONDITIONS (NOT EXCEEDING POSTED SPEED)
048	OPN DOOR	OPENED DOOR INTO ADJACENT TRAFFIC LANE
049	IMPEDING	IMPEDING TRAFFIC
050	SPEED	DRIVING IN EXCESS OF POSTED SPEED
051	RECKLESS	RECKLESS DRIVING (PER PAR)
052	CARELESS	CARELESS DRIVING (PER PAR)
053	RACING	SPEED RACING (PER PAR)
054	X N/SGNL	CROSSING AT INTERSECTION, NO TRAFFIC SIGNAL PRESENT
055	X W/SGNL	CROSSING AT INTERSECTION, TRAFFIC SIGNAL PRESENT
056	DIAGONAL	CROSSING AT INTERSECTION - DIAGONALLY
057	BTWN INT	CROSSING BETWEEN INTERSECTIONS
059	W/TRAF-S	WALKING, RUNNING, RIDING, ETC., ON SHOULDER WITH TRAFFIC
060	A/TRAF-S	WALKING, RUNNING, RIDING, ETC., ON SHOULDER FACING TRAFFIC
061	W/TRAF-P	WALKING, RUNNING, RIDING, ETC., ON PAVEMENT WITH TRAFFIC
062	A/TRAF-P	WALKING, RUNNING, RIDING, ETC., ON PAVEMENT FACING TRAFFIC
063	PLAYINRD	PLAYING IN STREET OR ROAD
064	PUSH MV	PUSHING OR WORKING ON VEHICLE IN ROAD OR ON SHOULDER
065	WORK IN RD	WORKING IN ROADWAY OR ALONG SHOULDER
070	LAY ON RD	STANDING OR LYING IN ROADWAY
071	NM IMP USE	IMPROPER USE OF TRAFFIC LANE BY NON-MOTORIST
073	ELUDING	ELUDING / ATTEMPT TO ELUDE
079	F NEG CURV	FAILED TO NEGOTIATE A CURVE
080	FAIL LN	FAILED TO MAINTAIN LANE
081	OFF RD	RAN OFF ROAD
082	NO CLEAR	DRIVER MISJUDGED CLEARANCE
083	OVRSTEER	OVER-CORRECTING
084	NOT USED	CODE NOT IN USE
085	OVRLOAD	OVERLOADING OR IMPROPER LOADING OF VEHICLE WITH CARGO OR PASSENGERS
097	UNA DIS TC	UNABLE TO DETERMINE WHICH DRIVER DISREGARDED TRAFFIC CONTROL DEVICE

EVENT CODE TRANSLATION LIST

EVENT CODE	SHORT DESCRIPTION	LONG DESCRIPTION
001	FEL/JUMP	OCCUPANT FELL, JUMPED OR WAS EJECTED FROM MOVING VEHICLE
002	INTERFER	PASSENGER INTERFERED WITH DRIVER
003	BUG INTF	ANIMAL OR INSECT IN VEHICLE INTERFERED WITH DRIVER
004	INDRCT PED	PEDESTRIAN INDIRECTLY INVOLVED (NOT STRUCK)
005	SUB-PED	"SUB-PED": PEDESTRIAN INJURED SUBSEQUENT TO COLLISION, ETC.
006	INDRCT BIK	PEDALCYCLIST INDIRECTLY INVOLVED (NOT STRUCK)
007	HITCHIKR	HITCHHIKER (SOLICITING A RIDE)
008	PSNGR TOW	PASSENGER OR NON-MOTORIST BEING TOWED OR PUSHED ON CONVEYANCE
009	ON/OFF V	GETTING ON/OFF STOPPED/PARKED VEHICLE (OCCUPANTS ONLY; MUST HAVE PHYSICAL CONTACT W/ VEHIC
010	SUB OTRN	OVERTURNED AFTER FIRST HARMFUL EVENT
011	MV PUSHD	VEHICLE BEING PUSHED
012	MV TOWED	VEHICLE TOWED OR HAD BEEN TOWING ANOTHER VEHICLE
013	FORCED	VEHICLE FORCED BY IMPACT INTO ANOTHER VEHICLE, PEDALCYCLIST OR PEDESTRIAN
014	SET MOTN	VEHICLE SET IN MOTION BY NON-DRIVER (CHILD RELEASED BRAKES, ETC.)
015	RR ROW	AT OR ON RAILROAD RIGHT-OF-WAY (NOT LIGHT RAIL)
016	LT RL ROW	AT OR ON LIGHT-RAIL RIGHT-OF-WAY
017	RR HIT V	TRAIN STRUCK VEHICLE
018	V HIT RR	VEHICLE STRUCK TRAIN
019	HIT RR CAR	VEHICLE STRUCK RAILROAD CAR ON ROADWAY
020	JACKNIFE	JACKKNIFE; TRAILER OR TOWED VEHICLE STRUCK TOWING VEHICLE
021	TRL OTRN	TRAILER OR TOWED VEHICLE OVERTURNED
022	CN BROKE	TRAILER CONNECTION BROKE
023	DETACH TRL	DETACHED TRAILING OBJECT STRUCK OTHER VEHICLE, NON-MOTORIST, OR OBJECT
024	V DOOR OPN	VEHICLE DOOR OPENED INTO ADJACENT TRAFFIC LANE
025	WHEELOFF	WHEEL CAME OFF
026	HOOD UP	HOOD FLEW UP
028	LOAD SHIFT	LOST LOAD, LOAD MOVED OR SHIFTED
029	TIREFAIL	TIRE FAILURE
030	PET	PET: CAT, DOG AND SIMILAR
031	LVSTOCK	STOCK: COW, CALF, BULL, STEER, SHEEP, ETC.
032	HORSE	HORSE, MULE, OR DONKEY
033	HRSE&RID	HORSE AND RIDER
034	GAME	WILD ANIMAL, GAME (INCLUDES BIRDS; NOT DEER OR ELK)
035	DEER ELK	DEER OR ELK, WAPITI
036	ANML VEH	ANIMAL-DRAWN VEHICLE
037	CULVERT	CULVERT, OPEN LOW OR HIGH MANHOLE
038	ATENUATN	IMPACT ATTENUATOR
039	PK METER	PARKING METER
040	CURB	CURB (ALSO NARROW SIDEWALKS ON BRIDGES)
041	JIGGLE	JIGGLE BAR OR TRAFFIC SNAKE FOR CHANNELIZATION
042	GDRL END	LEADING EDGE OF GUARDRAIL
043	GARDRAIL	GUARD RAIL (NOT METAL MEDIAN BARRIER)
044	BARRIER	MEDIAN BARRIER (RAISED OR METAL)
045	WALL	RETAINING WALL OR TUNNEL WALL
046	BR RAIL	BRIDGE RAILING OR PARAPET (ON BRIDGE OR APPROACH)
047	BR ABUTMNT	BRIDGE ABUTMENT (INCLUDED "APPROACH END" THRU 2013)
048	BR COLMN	BRIDGE PILLAR OR COLUMN
049	BR GIRDR	BRIDGE GIRDER (HORIZONTAL BRIDGE STRUCTURE OVERHEAD)
050	ISLAND	TRAFFIC RAISED ISLAND
051	GORE	GORE
052	POLE UNK	POLE - TYPE UNKNOWN
053	POLE UTL	POLE - POWER OR TELEPHONE
054	ST LIGHT	POLE - STREET LIGHT ONLY
055	TRF SGNL	POLE - TRAFFIC SIGNAL AND PED SIGNAL ONLY
056	SGN BRDG	POLE - SIGN BRIDGE
057	STOPSIGN	STOP OR YIELD SIGN

EVENT CODE TRANSLATION LIST

EVENT CODE	SHORT DESCRIPTION	LONG DESCRIPTION
058	OTH SIGN	OTHER SIGN, INCLUDING STREET SIGNS
059	HYDRANT	HYDRANT
060	MARKER	DELINEATOR OR MARKER (REFLECTOR POSTS)
061	MAILBOX	MAILBOX
062	TREE	TREE, STUMP OR SHRUBS
063	VEG OHED	TREE BRANCH OR OTHER VEGETATION OVERHEAD, ETC.
064	WIRE/CBL	WIRE OR CABLE ACROSS OR OVER THE ROAD
065	TEMP SGN	TEMPORARY SIGN OR BARRICADE IN ROAD, ETC.
066	PERM SGN	PERMANENT SIGN OR BARRICADE IN/OFF ROAD
067	SLIDE	SLIDES, FALLEN OR FALLING ROCKS
068	FRGN OBJ	FOREIGN OBSTRUCTION/DEBRIS IN ROAD (NOT GRAVEL)
069	EQP WORK	EQUIPMENT WORKING IN/OFF ROAD
070	OTH EQP	OTHER EQUIPMENT IN OR OFF ROAD (INCLUDES PARKED TRAILER, BOAT)
071	MAIN EQP	WRECKER, STREET SWEEPER, SNOW PLOW OR SANDING EQUIPMENT
072	OTHER WALL	ROCK, BRICK OR OTHER SOLID WALL
073	IRRGL PVMT	OTHER BUMP (NOT SPEED BUMP), POTHOLE OR PAVEMENT IRREGULARITY (PER PAR)
074	OVERHD OBJ	OTHER OVERHEAD OBJECT (HIGHWAY SIGN, SIGNAL HEAD, ETC.); NOT BRIDGE
075	CAVE IN	BRIDGE OR ROAD CAVE IN
076	HI WATER	HIGH WATER
077	SNO BANK	SNOW BANK
078	LO-HI EDGE	LOW OR HIGH SHOULDER AT PAVEMENT EDGE
079	DITCH	CUT SLOPE OR DITCH EMBANKMENT
080	OBJ FRM MV	STRUCK BY ROCK OR OTHER OBJECT SET IN MOTION BY OTHER VEHICLE (INCL. LOST LOADS)
081	FLY-OBJ	STRUCK BY ROCK OR OTHER MOVING OR FLYING OBJECT (NOT SET IN MOTION BY VEHICLE)
082	VEH HID	VEHICLE OBSCURED VIEW
083	VEG HID	VEGETATION OBSCURED VIEW
084	BLDG HID	VIEW OBSCURED BY FENCE, SIGN, PHONE BOOTH, ETC.
085	WIND GUST	WIND GUST
086	IMMERSED	VEHICLE IMMERSED IN BODY OF WATER
087	FIRE/EXP	FIRE OR EXPLOSION
088	FENC/BLD	FENCE OR BUILDING, ETC.
089	OTHR CRASH	CRASH RELATED TO ANOTHER SEPARATE CRASH
090	TO 1 SIDE	TWO-WAY TRAFFIC ON DIVIDED ROADWAY ALL ROUTED TO ONE SIDE
091	BUILDING	BUILDING OR OTHER STRUCTURE
092	PHANTOM	OTHER (PHANTOM) NON-CONTACT VEHICLE
093	CELL PHONE	CELL PHONE (ON PAR OR DRIVER IN USE)
094	VIOL GDL	TEENAGE DRIVER IN VIOLATION OF GRADUATED LICENSE PGM
095	GUY WIRE	GUY WIRE
096	BERM	BERM (EARTHEN OR GRAVEL MOUND)
097	GRAVEL	GRAVEL IN ROADWAY
098	ABR EDGE	ABRUPT EDGE
099	CELL WTNSD	CELL PHONE USE WITNESSED BY OTHER PARTICIPANT
100	UNK FIXD	FIXED OBJECT, UNKNOWN TYPE.
101	OTHER OBJ	NON-FIXED OBJECT, OTHER OR UNKNOWN TYPE
102	TEXTING	TEXTING
103	WZ WORKER	WORK ZONE WORKER
104	ON VEHICLE	PASSENGER RIDING ON VEHICLE EXTERIOR
105	PEDAL PSGR	PASSENGER RIDING ON PEDALCYCLE
106	MAN WHLCHR	PEDESTRIAN IN NON-MOTORIZED WHEELCHAIR
107	MTR WHLCHR	PEDESTRIAN IN MOTORIZED WHEELCHAIR
108	OFFICER	LAW ENFORCEMENT / POLICE OFFICER
109	SUB-BIKE	"SUB-BIKE": PEDALCYCLIST INJURED SUBSEQUENT TO COLLISION, ETC.
110	N-MTR	NON-MOTORIST STRUCK VEHICLE
111	S CAR VS V	STREET CAR/TROLLEY (ON RAILS OR OVERHEAD WIRE SYSTEM) STRUCK VEHICLE
112	V VS S CAR	VEHICLE STRUCK STREET CAR/TROLLEY (ON RAILS OR OVERHEAD WIRE SYSTEM)
113	S CAR ROW	AT OR ON STREET CAR OR TROLLEY RIGHT-OF-WAY

EVENT CODE TRANSLATION LIST

EVENT CODE	SHORT DESCRIPTION	LONG DESCRIPTION
114	RR EQUIP	VEHICLE STRUCK RAILROAD EQUIPMENT (NOT TRAIN) ON TRACKS
115	DSTRCT GPS	DISTRACTED BY NAVIGATION SYSTEM OR GPS DEVICE
116	DSTRCT OTH	DISTRACTED BY OTHER ELECTRONIC DEVICE
117	RR GATE	RAIL CROSSING DROP-ARM GATE
118	EXPNSN JNT	EXPANSION JOINT
119	JERSEY BAR	JERSEY BARRIER
120	WIRE BAR	WIRE OR CABLE MEDIAN BARRIER
121	FENCE	FENCE
123	OBJ IN VEH	LOOSE OBJECT IN VEHICLE STRUCK OCCUPANT
124	SLIPPERY	SLIDING OR SWERVING DUE TO WET, ICY, SLIPPERY OR LOOSE SURFACE (NOT GRAVEL)
125	SHLDR	SHOULDER GAVE WAY
126	BOULDER	ROCK(S), BOULDER (NOT GRAVEL; NOT ROCK SLIDE)
127	LAND SLIDE	ROCK SLIDE OR LAND SLIDE
128	CURVE INV	CURVE PRESENT AT CRASH LOCATION
129	HILL INV	VERTICAL GRADE / HILL PRESENT AT CRASH LOCATION
130	CURVE HID	VIEW OBSCURED BY CURVE
131	HILL HID	VIEW OBSCURED BY VERTICAL GRADE / HILL
132	WINDOW HID	VIEW OBSCURED BY VEHICLE WINDOW CONDITIONS
133	SPRAY HID	VIEW OBSCURED BY WATER SPRAY
134	TORRENTIAL	TORRENTIAL RAIN (EXCEPTIONALLY HEAVY RAIN)
135	RAIL OCC	INJURED OCCUPANT OF RAILWAY TRAIN, LIGHT RAIL, STREET CAR OR CABLE CAR

FUNCTIONAL CLASSIFICATION TRANSLATION LIST

FUNC CLASS	DESCRIPTION
01	RURAL PRINCIPAL ARTERIAL - INTERSTATE
02	RURAL PRINCIPAL ARTERIAL - OTHER
06	RURAL MINOR ARTERIAL
07	RURAL MAJOR COLLECTOR
08	RURAL MINOR COLLECTOR
09	RURAL LOCAL
11	URBAN PRINCIPAL ARTERIAL - INTERSTATE
12	URBAN PRINCIPAL ARTERIAL - OTHER FREEWAYS AND EXP
14	URBAN PRINCIPAL ARTERIAL - OTHER
16	URBAN MINOR ARTERIAL
17	URBAN MAJOR COLLECTOR
18	URBAN MINOR COLLECTOR
19	URBAN LOCAL
78	UNKNOWN RURAL SYSTEM
79	UNKNOWN RURAL NON-SYSTEM
98	UNKNOWN URBAN SYSTEM
99	UNKNOWN URBAN NON-SYSTEM

HIGHWAY COMPONENT TRANSLATION LIST

CODE	DESCRIPTION
0	MAINLINE STATE HIGHWAY
1	COUPLET
3	FRONTAGE ROAD
6	CONNECTION
8	HIGHWAY - OTHER

INJURY SEVERITY CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
1	KILL	FATAL INJURY (K)
2	INJA	SUSPECTED SERIOUS INJURY (A)
3	INJB	SUSPECTED MINOR INJURY (B)
4	INJC	POSSIBLE INJURY (C)
5	PRI	DIED PRIOR TO CRASH
7	NO<5	NO INJURY - 0 TO 4 YEARS OF AGE
9	NONE	NO APPARENT INJURY (O)

LIGHT CONDITION CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	UNK	UNKNOWN
1	DAY	DAYLIGHT
2	DLIT	DARKNESS - WITH STREET LIGHTS
3	DARK	DARKNESS - NO STREET LIGHTS
4	DAWN	DAWN (TWILIGHT)
5	DUSK	DUSK (TWILIGHT)

MEDIAN TYPE CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	NONE	NO MEDIAN
1	RSDMD	SOLID MEDIAN BARRIER
2	DIVMD	EARTH, GRASS OR PAVED MEDIAN

MILEAGE TYPE CODE TRANSLATION LIST

CODE	LONG DESCRIPTION
0	REGULAR MILEAGE
T	TEMPORARY
Y	SPUR
Z	OVERLAPPING

MOVEMENT TYPE CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	UNK	UNKNOWN
1	STRGHT	STRAIGHT AHEAD
2	TURN-R	TURNING RIGHT
3	TURN-L	TURNING LEFT
4	U-TURN	MAKING A U-TURN
5	BACK	BACKING
6	STOP	STOPPED IN TRAFFIC
7	PRKD-P	PARKED - PROPERLY
8	PRKD-I	PARKED - IMPROPERLY
9	PARKNG	PARKING MANEUVER

NON-MOTORIST LOCATION CODE TRANSLATION LIST

CODE	LONG DESCRIPTION
00	AT INTERSECTION - NOT IN ROADWAY
01	AT INTERSECTION - INSIDE CROSSWALK
02	AT INTERSECTION - IN ROADWAY, OUTSIDE CROSSWALK
03	AT INTERSECTION - IN ROADWAY, XWALK AVAIL UNKNWN
04	NOT AT INTERSECTION - IN ROADWAY
05	NOT AT INTERSECTION - ON SHOULDER
06	NOT AT INTERSECTION - ON MEDIAN
07	NOT AT INTERSECTION - WITHIN TRAFFIC RIGHT-OF-WAY
08	NOT AT INTERSECTION - IN BIKE PATH OR PARKING LANE
09	NOT-AT INTERSECTION - ON SIDEWALK
10	OUTSIDE TRAFFICWAY BOUNDARIES
13	AT INTERSECTION - IN BIKE LANE
14	NOT AT INTERSECTION - IN BIKE LANE
15	NOT AT INTERSECTION - INSIDE MID-BLOCK CROSSWALK
16	NOT AT INTERSECTION - IN PARKING LANE
18	OTHER, NOT IN ROADWAY
99	UNKNOWN LOCATION

ROAD CHARACTER CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	UNK	UNKNOWN
1	INTER	INTERSECTION
2	ALLEY	DRIVEWAY OR ALLEY
3	STRGHT	STRAIGHT ROADWAY
4	TRANS	TRANSITION
5	CURVE	CURVE (HORIZONTAL CURVE)
6	OPENAC	OPEN ACCESS OR TURNOUT
7	GRADE	GRADE (VERTICAL CURVE)
8	BRIDGE	BRIDGE STRUCTURE
9	TUNNEL	TUNNEL

PARTICIPANT TYPE CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	OCC	UNKNOWN OCCUPANT TYPE
1	DRVR	DRIVER
2	PSNG	PASSENGER
3	PED	PEDESTRIAN
4	CONV	PEDESTRIAN USING A PEDESTRIAN CONVEYA
5	PTOW	PEDESTRIAN TOWING OR TRAILERING AN OB
6	BIKE	PEDALCYCLIST
7	BTOW	PEDALCYCLIST TOWING OR TRAILERING AN
8	PRKD	OCCUPANT OF A PARKED MOTOR VEHICLE
9	OTHR	OTHER TYPE OF NON-MOTORIST

TRAFFIC CONTROL DEVICE CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
000	NONE	NO CONTROL
001	TRF SIGNAL	TRAFFIC SIGNALS
002	FLASHBCN-R	FLASHING BEACON - RED (STOP)
003	FLASHBCN-A	FLASHING BEACON - AMBER (SLOW)
004	STOP SIGN	STOP SIGN
005	SLOW SIGN	SLOW SIGN
006	REG-SIGN	REGULATORY SIGN
007	YIELD	YIELD SIGN
008	WARNING	WARNING SIGN
009	CURVE	CURVE SIGN
010	SCHL X-ING	SCHOOL CROSSING SIGN OR SPECIAL SIGNAL
011	OFCR/FLAG	POLICE OFFICER, FLAGMAN - SCHOOL PATROL
012	BRDG-GATE	BRIDGE GATE - BARRIER
013	TEMP-BARR	TEMPORARY BARRIER
014	NO-PASS-ZN	NO PASSING ZONE
015	ONE-WAY	ONE-WAY STREET
016	CHANNEL	CHANNELIZATION
017	MEDIAN BAR	MEDIAN BARRIER
018	PILOT CAR	PILOT CAR
019	SP PED SIG	SPECIAL PEDESTRIAN SIGNAL
020	X-BUCK	CROSSBUCK
021	THR-GN-SIG	THROUGH GREEN ARROW OR SIGNAL
022	L-GRN-SIG	LEFT TURN GREEN ARROW, LANE MARKINGS, OR SIGNAL
023	R-GRN-SIG	RIGHT TURN GREEN ARROW, LANE MARKINGS, OR SIGNAL
024	WIGWAG	WIGWAG OR FLASHING LIGHTS W/O DROP-ARM GATE
025	X-BUCK WRN	CROSSBUCK AND ADVANCE WARNING
026	WW W/ GATE	FLASHING LIGHTS WITH DROP-ARM GATES
027	OVRHD SGNL	SUPPLEMENTAL OVERHEAD SIGNAL (RR XING ONLY)
028	SP RR STOP	SPECIAL RR STOP SIGN
029	ILUM GRD X	ILLUMINATED GRADE CROSSING
037	RAMP METER	METERED RAMPS
038	RUMBLE STR	RUMBLE STRIP
040	AUTO. FLAG	AUTOMATED FLAGGER ASSISTANCE DEVICE
090	L-TURN REF	LEFT TURN REFUGE (WHEN REFUGE IS INVOLVED)
091	R-TURN ALL	RIGHT TURN AT ALL TIMES SIGN, ETC.
092	EMR SGN/FL	EMERGENCY SIGNS OR FLARES
093	ACCEL LANE	ACCELERATION OR DECELERATION LANES
094	R-TURN PRO	RIGHT TURN PROHIBITED ON RED AFTER STOPPING
095	BUS STPSGN	BUS STOP SIGN AND RED LIGHTS

099	UNKNOWN	UNKNOWN OR NOT DEFINITE

VEHICLE TYPE CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
00	PDO	NOT COLLECTED FOR PDO CRASHES
01	PSNGR CAR	PASSENGER CAR, PICKUP, LIGHT DELIVERY, ETC.
02	BOBTAIL	TRUCK TRACTOR WITH NO TRAILERS (BOBTAIL)
03	FARM TRCTR	FARM TRACTOR OR SELF-PROPELLED FARM EQUIPMENT
04	SEMI TOW	TRUCK TRACTOR WITH TRAILER/MOBILE HOME IN TOW
05	TRUCK	TRUCK WITH NON-DETACHABLE BED, PANEL, ETC.
06	MOPED	MOPED, MINIBIKE, SEATED MOTOR SCOOTER (REV. 2022)
07	SCHL BUS	SCHOOL BUS (INCLUDES VAN)
08	OTH BUS	OTHER BUS
09	MTRCYCLE	MOTORCYCLE, DIRT BIKE
10	OTHER	OTHER: FORKLIFT, BACKHOE, ETC.
11	MOTRHOME	MOTORHOME
12	TROLLEY	MOTORIZED STREET CAR/TROLLEY (NO RAILS/WIRES)
13	ATV	ATV
14	MTRSCTR	MOTORIZED SCOOTER (STANDING)
15	SNOWMOBILE	SNOWMOBILE
16	MTRZ/EBIKE	MOTORIZED OR ELECTRIC BICYCLE (E-BIKE) (EFF.2022)
17	UTV	UTV SIDE BY SIDE
99	UNKNOWN	UNKNOWN VEHICLE TYPE

WEATHER CONDITION CODE TRANSLATION LIST

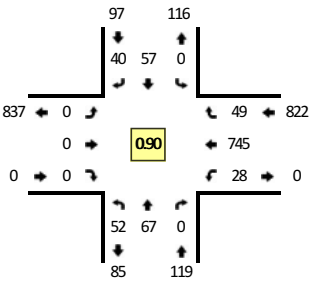
CODE	SHORT DESC	LONG DESCRIPTION
0	UNK	UNKNOWN
1	CLR	CLEAR
2	CLD	CLOUDY
3	RAIN	RAIN
4	SLT	SLEET
5	FOG	FOG
6	SNOW	SNOW
7	DUST	DUST
8	SMOK	SMOKE
9	ASH	ASH

Appendix B:
Traffic Counts

Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

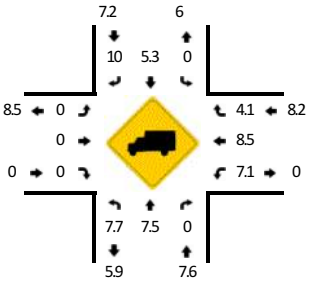
LOCATION: N 4th Ave -- N Adair St | **QC JOB #:** 16704703
CITY/STATE: Cornelius, OR | **DATE:** Wed, Aug 7 2024

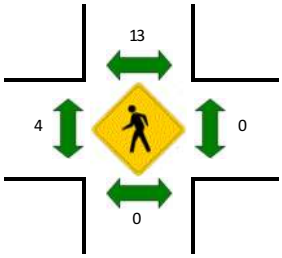
Peak-Hour: 8:00 AM -- 9:00 AM
Peak 15-Min: 8:45 AM -- 9:00 AM

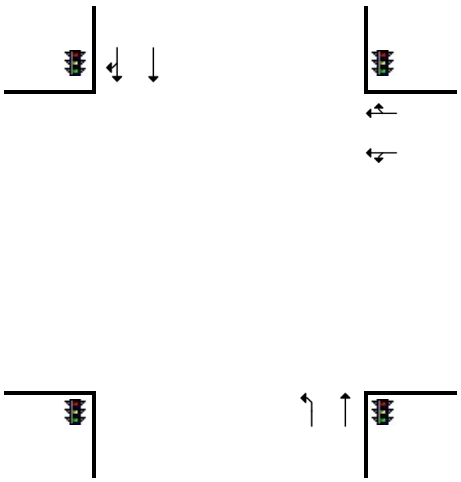


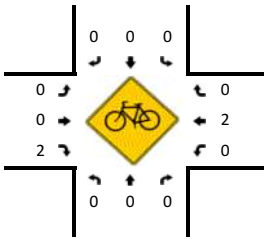


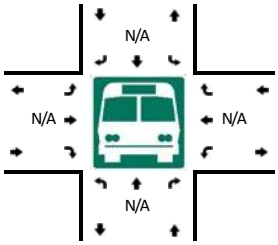
TRUE DATA TO IMPROVE MOBILITY

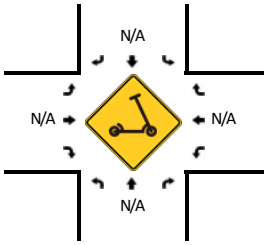












5-Min Count Period Beginning At	N 4th Ave (Northbound)				N 4th Ave (Southbound)				N Adair St (Eastbound)				N Adair St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	3	8	0	0	0	7	4	0	0	0	0	0	1	35	1	0	59	
7:05 AM	2	5	0	0	0	3	1	0	0	0	0	0	1	42	1	0	55	
7:10 AM	1	9	0	0	0	5	7	0	0	0	0	0	1	51	4	0	78	
7:15 AM	1	4	0	0	0	6	3	0	0	0	0	0	1	35	2	0	52	
7:20 AM	3	6	0	0	0	4	7	0	0	0	0	0	1	57	2	0	80	
7:25 AM	0	5	0	0	0	1	0	0	0	0	0	0	1	50	2	0	59	
7:30 AM	2	9	0	0	0	2	1	0	0	0	0	0	1	54	2	0	71	
7:35 AM	3	6	0	0	0	3	2	0	0	0	0	0	2	65	7	0	88	
7:40 AM	3	8	0	0	0	4	4	0	0	0	0	0	2	51	2	0	74	
7:45 AM	4	6	0	0	0	2	1	0	0	0	0	0	3	46	6	0	68	
7:50 AM	0	7	0	0	0	4	2	0	0	0	0	0	2	88	5	0	108	
7:55 AM	2	6	0	0	0	8	1	0	0	0	0	0	3	55	1	0	76	868
8:00 AM	7	7	0	0	0	2	5	0	0	0	0	0	2	62	4	0	89	898
8:05 AM	4	6	0	0	0	3	2	0	0	0	0	0	1	64	6	0	86	929
8:10 AM	1	5	0	0	0	5	3	0	0	0	0	0	2	53	6	0	75	926
8:15 AM	7	3	0	0	0	8	3	0	0	0	0	0	3	48	4	0	76	950
8:20 AM	3	5	0	0	0	6	1	0	0	0	0	0	3	61	5	0	84	954
8:25 AM	4	6	0	0	0	1	7	0	0	0	0	0	2	68	1	0	89	984
8:30 AM	6	5	0	0	0	7	2	0	0	0	0	0	6	50	4	0	80	993
8:35 AM	5	7	0	0	0	3	5	0	0	0	0	0	2	62	6	0	90	995
8:40 AM	4	5	0	0	0	8	2	0	0	0	0	0	2	57	3	0	81	1002
8:45 AM	1	1	0	0	0	5	3	0	0	0	0	0	0	83	5	0	98	1032
8:50 AM	3	8	0	0	0	4	5	0	0	0	0	0	4	70	3	0	97	1021
8:55 AM	7	9	0	0	0	5	2	0	0	0	0	0	1	67	2	0	93	1038

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	44	72	0	0	0	56	40	0	0	0	0	0	20	880	40	0	1152
Heavy Trucks	0	0	0		0	0	0		0	0	0		0	80	4		84
Buses																	
Pedestrians		0				24				0				0			24
Bicycles	0	0	0		0	0	0		0	0	0		0	4	0		4
Scooters																	

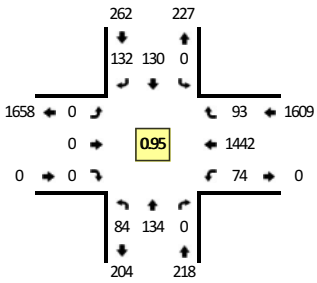
Comments: Additional cameras were placed here to obtain video of the northbound, southbound, and westbound queues.

Report generated on 8/12/2024 3:09 PM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

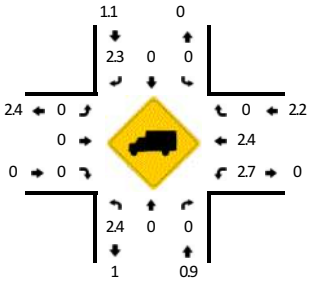
LOCATION: N 4th Ave -- N Adair St | **QC JOB #:** 16704704
CITY/STATE: Cornelius, OR | **DATE:** Wed, Aug 7 2024

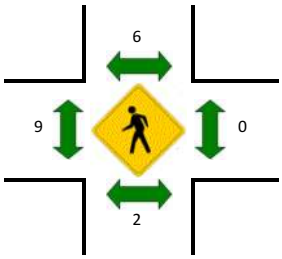
Peak-Hour: 4:25 PM -- 5:25 PM
Peak 15-Min: 5:00 PM -- 5:15 PM

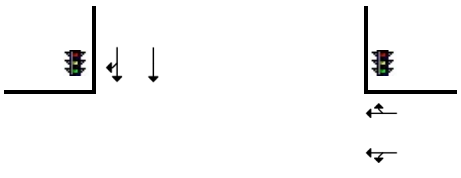


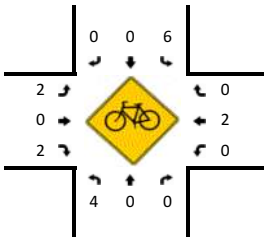


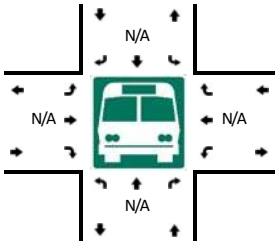
TRUE DATA TO IMPROVE MOBILITY



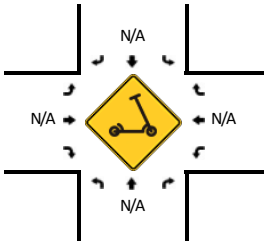












5-Min Count Period Beginning At	N 4th Ave (Northbound)				N 4th Ave (Southbound)				N Adair St (Eastbound)				N Adair St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	10	14	0	0	0	12	9	0	0	0	0	0	4	101	8	0	158	
4:05 PM	5	9	0	0	0	9	11	0	0	0	0	0	8	98	4	0	144	
4:10 PM	2	17	0	0	0	10	11	0	0	0	0	0	7	107	6	0	160	
4:15 PM	4	6	0	0	0	8	8	0	0	0	0	0	8	130	7	0	171	
4:20 PM	6	23	0	0	0	10	11	0	0	0	0	0	8	99	3	0	160	
4:25 PM	6	14	0	0	0	13	7	0	0	0	0	0	4	132	5	0	181	
4:30 PM	4	9	0	0	0	12	15	0	0	0	0	0	9	137	7	0	193	
4:35 PM	5	18	0	0	0	17	12	0	0	0	0	0	13	97	9	0	171	
4:40 PM	10	7	0	0	0	9	11	0	0	0	0	0	4	105	13	0	159	
4:45 PM	7	6	0	0	0	9	13	0	0	0	0	0	1	118	5	0	159	
4:50 PM	4	20	0	0	0	7	10	0	0	0	0	0	3	113	8	0	165	
4:55 PM	9	7	0	0	0	13	13	0	0	0	0	0	4	115	8	0	169	1990
5:00 PM	9	8	0	0	0	10	14	0	0	0	0	0	8	127	5	0	181	2013
5:05 PM	13	15	0	0	0	7	11	0	0	0	0	0	5	123	11	0	185	2054
5:10 PM	4	7	0	0	0	13	8	0	0	0	0	0	8	142	3	0	185	2079
5:15 PM	3	6	0	0	0	7	8	0	0	0	0	0	9	128	9	0	170	2078
5:20 PM	10	17	0	0	0	13	10	0	0	0	0	0	6	105	10	0	171	2089
5:25 PM	4	7	0	0	0	8	6	0	0	0	0	0	7	124	4	0	160	2068
5:30 PM	6	13	0	0	0	11	11	0	0	0	0	0	2	105	8	0	156	2031
5:35 PM	4	22	0	0	0	17	13	0	0	0	0	0	3	104	8	0	171	2031
5:40 PM	5	5	0	0	0	7	4	0	0	0	0	0	2	96	11	0	130	2002
5:45 PM	4	9	0	0	0	9	8	0	0	0	0	0	11	111	7	0	159	2002
5:50 PM	10	17	0	0	0	9	2	0	0	0	0	0	8	123	7	0	176	2013
5:55 PM	9	9	0	0	0	8	7	0	0	0	0	0	8	99	8	0	148	1992

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	104	120	0	0	0	120	132	0	0	0	0	0	84	1568	76	0	2204
Heavy Trucks	4	0	0		0	0	8		0	0	0		0	44	0		56
Buses																	
Pedestrians		0				4				28				0			32
Bicycles	0	0	0		8	0	0		4	0	4		0	0	0		16
Scooters																	

Comments: Additional cameras were placed here to obtain video of the northbound, southbound, and westbound queues.

Report generated on 8/12/2024 3:09 PM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

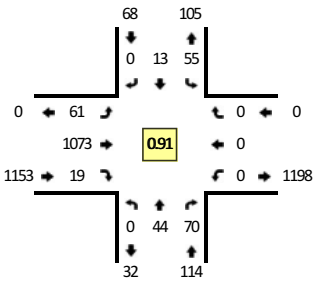
Type of peak hour being reported: Intersection Peak

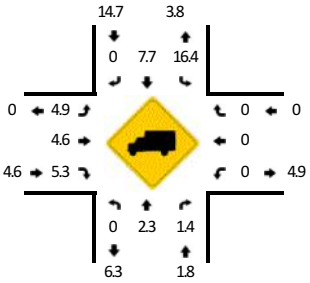
Method for determining peak hour: Total Entering Volume

LOCATION: N 4th Ave -- W Baseline St
CITY/STATE: Cornelius, OR

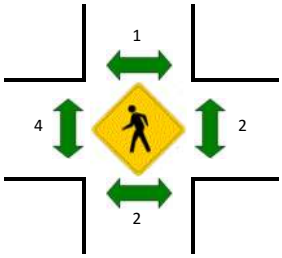
QC JOB #: 16704705
DATE: Wed, Aug 7 2024

Peak-Hour: 7:05 AM -- 8:05 AM
Peak 15-Min: 7:35 AM -- 7:50 AM

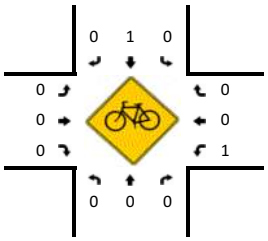


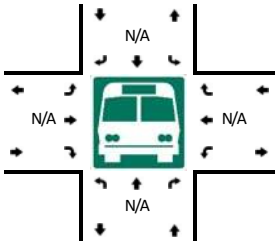


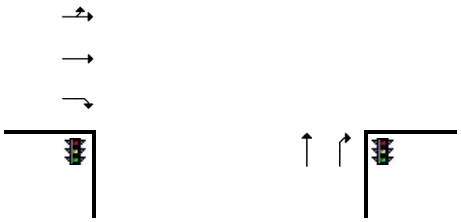
TRUE DATA TO IMPROVE MOBILITY

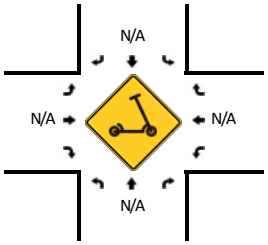












5-Min Count Period Beginning At	N 4th Ave (Northbound)				N 4th Ave (Southbound)				W Baseline St (Eastbound)				W Baseline St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	2	3	0	6	2	0	0	7	74	3	0	0	0	0	0	97	
7:05 AM	0	3	7	0	5	1	0	0	4	88	0	0	0	0	0	0	108	
7:10 AM	0	4	5	0	5	1	0	0	7	91	2	0	0	0	0	0	115	
7:15 AM	0	2	5	0	5	0	0	0	2	97	3	0	0	0	0	0	114	
7:20 AM	0	5	3	0	5	1	0	0	5	66	2	0	0	0	0	0	87	
7:25 AM	0	1	6	0	2	2	0	0	3	116	1	0	0	0	0	0	131	
7:30 AM	0	5	5	0	3	1	0	0	6	88	2	0	0	0	0	0	110	
7:35 AM	0	3	8	0	3	1	0	0	6	92	0	0	0	0	0	0	113	
7:40 AM	0	5	8	0	6	1	0	0	7	90	1	0	0	0	0	0	118	
7:45 AM	0	4	9	0	2	2	0	0	9	108	2	0	0	0	0	0	136	
7:50 AM	0	3	4	0	4	1	0	0	3	90	2	0	0	0	0	0	107	
7:55 AM	0	5	3	0	13	0	0	0	4	66	3	0	0	0	0	0	94	1330
8:00 AM	0	4	7	0	2	2	0	0	5	81	1	0	0	0	0	0	102	1335
8:05 AM	0	5	10	0	3	1	0	0	6	67	4	0	0	0	0	0	96	1323
8:10 AM	0	1	2	0	4	3	0	0	6	71	0	0	0	0	0	0	87	1295
8:15 AM	0	5	4	0	6	5	0	0	4	60	0	0	0	0	0	0	84	1265
8:20 AM	0	2	3	0	3	2	0	0	6	65	3	0	0	0	0	0	84	1262
8:25 AM	0	4	4	0	5	2	0	0	10	76	5	0	0	0	0	0	106	1237
8:30 AM	0	3	3	0	5	2	0	1	7	78	2	0	0	0	0	0	101	1228
8:35 AM	0	2	4	0	5	5	0	0	7	62	1	0	0	0	0	0	86	1201
8:40 AM	0	4	7	0	7	3	0	0	4	79	1	0	0	0	0	0	105	1188
8:45 AM	0	1	7	0	4	1	0	0	1	85	1	0	0	0	0	0	100	1152
8:50 AM	0	6	5	0	4	4	0	0	7	69	2	0	0	0	0	0	97	1142
8:55 AM	0	7	8	0	7	0	0	0	10	85	5	0	0	0	0	0	122	1170

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	48	100	0	44	16	0	0	88	1160	12	0	0	0	0	0	1468
Heavy Trucks	0	0	0		8	0	0		0	40	0		0	0	0		48
Buses																	
Pedestrians		8				0				8				0			16
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 8/12/2024 3:09 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

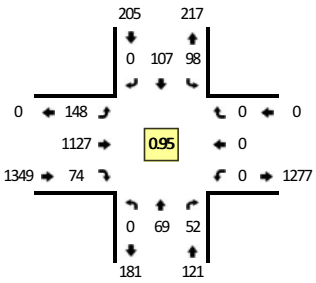
Type of peak hour being reported: Intersection Peak

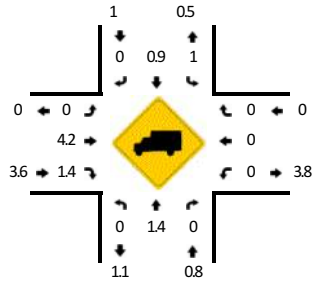
Method for determining peak hour: Total Entering Volume

LOCATION: N 4th Ave -- W Baseline St
CITY/STATE: Cornelius, OR

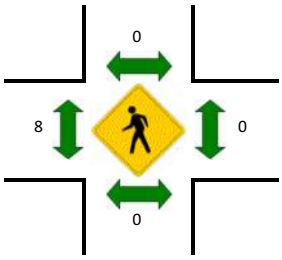
QC JOB #: 16704706
DATE: Wed, Aug 7 2024

Peak-Hour: 4:15 PM -- 5:15 PM
Peak 15-Min: 4:15 PM -- 4:30 PM

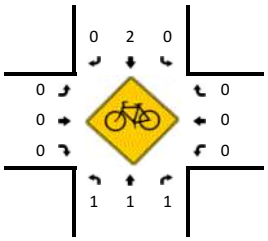


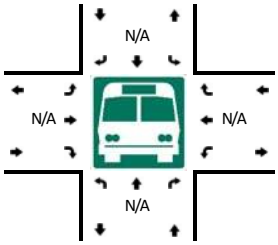


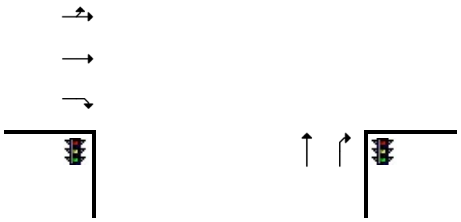
TRUE DATA TO IMPROVE MOBILITY

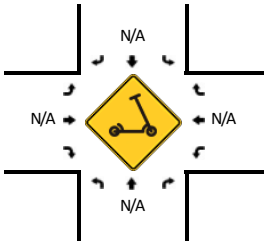












5-Min Count Period Beginning At	N 4th Ave (Northbound)				N 4th Ave (Southbound)				W Baseline St (Eastbound)				W Baseline St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	7	3	0	11	5	0	0	14	101	4	0	0	0	0	0	145	
4:05 PM	0	3	3	0	6	7	0	0	10	79	8	0	0	0	0	0	116	
4:10 PM	0	7	3	0	12	9	0	0	14	85	7	0	0	0	0	0	137	
4:15 PM	0	8	1	0	8	4	0	0	7	100	7	0	0	0	0	0	135	
4:20 PM	0	5	6	0	9	8	0	0	17	107	6	0	0	0	0	0	158	
4:25 PM	0	10	6	0	11	10	0	0	10	96	4	0	0	0	0	0	147	
4:30 PM	0	5	8	0	10	10	0	0	11	85	5	0	0	0	0	0	134	
4:35 PM	0	2	5	0	10	13	0	0	17	99	7	0	0	0	0	0	153	
4:40 PM	0	6	6	0	9	14	0	0	11	100	4	0	0	0	0	0	150	
4:45 PM	0	2	2	0	4	5	0	0	13	73	11	0	0	0	0	0	110	
4:50 PM	0	5	2	0	4	6	0	0	17	99	6	0	0	0	0	0	139	
4:55 PM	0	9	4	0	9	9	0	0	10	72	1	0	0	0	0	0	114	1638
5:00 PM	0	7	3	0	8	7	0	0	17	89	6	0	0	0	0	0	137	1630
5:05 PM	0	5	5	0	4	7	0	0	13	96	8	0	0	0	0	0	138	1652
5:10 PM	0	5	4	0	12	14	0	0	5	111	9	0	0	0	0	0	160	1675
5:15 PM	0	3	6	0	8	6	0	0	11	96	2	0	0	0	0	0	132	1672
5:20 PM	0	4	2	0	9	9	0	0	18	114	5	0	0	0	0	0	161	1675
5:25 PM	0	6	5	0	8	14	0	0	8	89	3	0	0	0	0	0	133	1661
5:30 PM	0	2	6	0	8	4	0	0	17	81	8	0	0	0	0	0	126	1653
5:35 PM	0	7	5	0	12	6	0	0	16	99	4	0	0	0	0	0	149	1649
5:40 PM	0	5	5	0	8	4	0	0	8	78	9	0	0	0	0	0	117	1616
5:45 PM	0	3	7	0	6	14	0	0	11	98	4	0	0	0	0	0	143	1649
5:50 PM	0	6	2	0	6	7	0	0	18	72	5	0	0	0	0	0	116	1626
5:55 PM	0	9	5	0	9	11	0	0	11	96	9	0	0	0	0	0	150	1662

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	92	52	0	112	88	0	0	136	1212	68	0	0	0	0	0	1760
Heavy Trucks	0	0	0		4	0	0		0	72	0		0	0	0		76
Buses																	
Pedestrians		0				0				8				0			8
Bicycles	0	4	0		0	4	0		0	0	0		0	0	0		8
Scooters																	

Comments:

Report generated on 8/12/2024 3:09 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Appendix C:
Existing Traffic Conditions
Analysis Worksheets

Intersection Level Of Service Report
Intersection 1: N Adair Street and N 4th Avenue

Control Type:	Signalized	Delay (sec / veh):	10.4
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.339

Intersection Setup

Name	N 4th Ave.			N 4th Ave.			N Adair St.			N Adair St.		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	1	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	49.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes						Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	N 4th Ave.			N 4th Ave.			N Adair St.			N Adair St.		
Base Volume Input [veh/h]	52	67	0	0	57	40	0	0	0	28	745	49
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	8.00	8.00	2.00	2.00	5.00	10.00	2.00	2.00	2.00	7.00	9.00	4.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	12	0	0	0	0	0	0
Total Hourly Volume [veh/h]	52	67	0	0	57	28	0	0	0	28	745	49
Peak Hour Factor	0.9000	0.9000	1.0000	1.0000	0.9000	0.9000	1.0000	1.0000	1.0000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	19	0	0	16	8	0	0	0	8	207	14
Total Analysis Volume [veh/h]	58	74	0	0	63	31	0	0	0	31	828	54
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			2			2			0		
v_di, Inbound Pedestrian Volume crossing m	0			2			2			0		
v_co, Outbound Pedestrian Volume crossing	0			6			0			7		
v_ci, Inbound Pedestrian Volume crossing mi	0			7			0			6		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	50.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	4	0	0	0	0	0	6	0
Auxiliary Signal Groups												
Maximum Green [s]	0	40	0	0	40	0	0	0	0	0	60	0
Amber [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	0.0	0.0	0.0	4.0	0.0
All red [s]	0.0	0.5	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.5	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	8	0
Pedestrian Clearance [s]	0	13	0	0	16	0	0	0	0	0	15	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.5	0.0	0.0	2.5	0.0	0.0	0.0	0.0	0.0	2.5	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	30	0	0	30	0	0	0	0	0	60	0
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	0	0	0	10	0
Vehicle Extension [s]	0.0	2.5	0.0	0.0	2.5	0.0	0.0	0.0	0.0	0.0	6.1	0.0
Minimum Recall		No			No						Yes	
Maximum Recall		No			No						No	
Pedestrian Recall		No			No						No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	C		C	C
C, Cycle Length [s]	90	90	90	90		90	90
L, Total Lost Time per Cycle [s]	4.50	4.50	4.50	4.50		4.50	4.50
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00		0.00	0.00
l2, Clearance Lost Time [s]	2.50	2.50	2.50	2.50		2.50	2.50
g_i, Effective Green Time [s]	11	11	11	11		70	70
g / C, Green / Cycle	0.12	0.12	0.12	0.12		0.78	0.78
(v / s)_i Volume / Saturation Flow Rate	0.05	0.04	0.03	0.03		0.26	0.26
s, saturation flow rate [veh/h]	1230	1780	1825	1623		1759	1727
c, Capacity [veh/h]	162	210	216	192		1375	1351
d1, Uniform Delay [s]	41.17	36.52	35.92	36.04		2.90	2.90
k, delay calibration	0.08	0.08	0.08	0.08		0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00
d2, Incremental Delay [s]	1.00	0.74	0.37	0.49		0.66	0.67
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00

Lane Group Results

X, volume / capacity	0.36	0.35	0.22	0.25		0.33	0.34
d, Delay for Lane Group [s/veh]	42.17	37.26	36.30	36.53		3.56	3.57
Lane Group LOS	D	D	D	D		A	A
Critical Lane Group	Yes	No	No	No		No	Yes
50th-Percentile Queue Length [veh/ln]	1.29	1.52	0.95	0.95		1.57	1.55
50th-Percentile Queue Length [ft/ln]	32.25	38.08	23.67	23.84		39.24	38.69
95th-Percentile Queue Length [veh/ln]	2.32	2.74	1.70	1.72		2.83	2.79
95th-Percentile Queue Length [ft/ln]	58.06	68.54	42.61	42.91		70.63	69.64

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	42.17	37.26	0.00	0.00	36.35	36.53	0.00	0.00	0.00	3.56	3.56	3.57
Movement LOS	D	D			D	D				A	A	A
d_A, Approach Delay [s/veh]	39.42			36.41			0.00			3.56		
Approach LOS	D			D			A			A		
d_I, Intersection Delay [s/veh]	10.43											
Intersection LOS	B											
Intersection V/C	0.339											

Emissions

Vehicle Miles Traveled [mph]	3.12	3.98	1.65	1.65		20.30	19.95
Stops [stops/h]	51.60	60.92	37.87	38.14		62.78	61.90
Fuel consumption [US gal/h]	0.91	1.06	0.62	0.63		1.68	1.65
CO [g/h]	63.69	74.20	43.65	43.91		117.24	115.44
NOx [g/h]	12.39	14.44	8.49	8.54		22.81	22.46
VOC [g/h]	14.76	17.20	10.12	10.18		27.17	26.75

Other Modes

g_Walk,mi, Effective Walk Time [s]	12.0	12.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	1122.94	3085.94	0.00
d_p, Pedestrian Delay [s]	33.80	33.80	34.67	34.67
l_p,int, Pedestrian LOS Score for Intersectio	2.185	2.204	2.250	2.335
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	567	567	0	1233
d_b, Bicycle Delay [s]	23.11	23.11	45.00	6.61
l_b,int, Bicycle LOS Score for Intersection	1.777	1.647	4.132	2.313
Bicycle LOS	A	A	D	B

Sequence

Ring 1	6	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: W Baseline Street and N/S 4th Avenue

Control Type:	Signalized	Delay (sec / veh):	7.3
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.432

Intersection Setup

Name	S 4th Ave.			N 4th Ave.			W Baseline St.			W Baseline St.		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	1	0	0	0	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	140.00	100.00	100.00	100.00	100.00	100.00	66.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S 4th Ave.			N 4th Ave.			W Baseline St.			W Baseline St.		
Base Volume Input [veh/h]	0	44	70	55	13	0	61	1073	19	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	1.00	16.00	8.00	2.00	5.00	5.00	5.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	40	0	0	0	0	0	4	0	0	0
Total Hourly Volume [veh/h]	0	44	30	55	13	0	61	1073	15	0	0	0
Peak Hour Factor	1.0000	0.9100	0.9100	0.9100	0.9100	1.0000	0.9100	0.9100	0.9100	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	12	8	15	4	0	17	295	4	0	0	0
Total Analysis Volume [veh/h]	0	48	33	60	14	0	67	1179	16	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	1			2			2			1		
v_di, Inbound Pedestrian Volume crossing m	1			2			2			1		
v_co, Outbound Pedestrian Volume crossing	1			1			1			0		
v_ci, Inbound Pedestrian Volume crossing mi	1			0			1			1		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	85.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	4	0	0	2	0	0	0	0
Auxiliary Signal Groups												
Maximum Green [s]	0	25	0	0	25	0	0	60	0	0	0	0
Amber [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	0.0	0.0
All red [s]	0.0	0.5	0.0	0.0	0.5	0.0	0.0	0.5	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	10	0	0	10	0	0	0	0
Pedestrian Clearance [s]	0	12	0	0	14	0	0	12	0	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.5	0.0	0.0	2.5	0.0	0.0	2.5	0.0	0.0	0.0	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	30	0	0	30	0	0	60	0	0	0	0
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	10	0	0	0	0
Vehicle Extension [s]	0.0	2.5	0.0	0.0	2.5	0.0	0.0	5.8	0.0	0.0	0.0	0.0
Minimum Recall		No			No			Yes				
Maximum Recall		No			No			No				
Pedestrian Recall		No			No			No				

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C	C	C	R	
C, Cycle Length [s]	90	90	90	90	90	90	90	
L, Total Lost Time per Cycle [s]	4.50	4.50	4.50	4.50	4.50	4.50	4.50	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.50	2.50	2.50	2.50	2.50	2.50	2.50	
g_i, Effective Green Time [s]	8	8	8	8	73	73	73	
g / C, Green / Cycle	0.09	0.09	0.09	0.09	0.81	0.81	0.81	
(v / s)_i Volume / Saturation Flow Rate	0.03	0.02	0.05	0.01	0.34	0.34	0.01	
s, saturation flow rate [veh/h]	1870	1591	1163	1780	1815	1825	1549	
c, Capacity [veh/h]	166	141	158	158	1473	1481	1257	
d1, Uniform Delay [s]	38.36	38.16	41.29	37.68	2.43	2.43	1.62	
k, delay calibration	0.08	0.08	0.08	0.08	0.50	0.50	0.50	
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.71	0.62	1.11	0.18	0.89	0.88	0.02	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	0.29	0.23	0.38	0.09	0.42	0.42	0.01	
d, Delay for Lane Group [s/veh]	39.07	38.79	42.40	37.85	3.32	3.32	1.64	
Lane Group LOS	D	D	D	D	A	A	A	
Critical Lane Group	No	No	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	1.01	0.69	1.34	0.29	2.11	2.12	0.04	
50th-Percentile Queue Length [ft/ln]	25.31	17.36	33.52	7.21	52.69	52.89	0.91	
95th-Percentile Queue Length [veh/ln]	1.82	1.25	2.41	0.52	3.79	3.81	0.07	
95th-Percentile Queue Length [ft/ln]	45.55	31.25	60.34	12.98	94.84	95.20	1.63	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	39.07	38.79	42.40	37.85	0.00	3.32	3.32	1.64	0.00	0.00	0.00
Movement LOS		D	D	D	D		A	A	A			
d_A, Approach Delay [s/veh]	38.96			41.54			3.30			0.00		
Approach LOS	D			D			A			A		
d_I, Intersection Delay [s/veh]	7.33											
Intersection LOS	A											
Intersection V/C	0.432											

Emissions

Vehicle Miles Traveled [mph]	2.31	1.58	3.23	0.75	43.70	43.92	1.13	
Stops [stops/h]	40.49	27.78	53.63	11.54	84.30	84.62	1.45	
Fuel consumption [US gal/h]	0.70	0.48	0.95	0.20	2.69	2.70	0.06	
CO [g/h]	48.95	33.50	66.18	14.16	187.69	188.52	4.17	
NOx [g/h]	9.52	6.52	12.88	2.75	36.52	36.68	0.81	
VOC [g/h]	11.34	7.76	15.34	3.28	43.50	43.69	0.97	

Other Modes

g_Walk,mi, Effective Walk Time [s]	14.0	14.0	14.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	4107.86	0.00
d_p, Pedestrian Delay [s]	32.09	32.09	32.09	34.67
l_p,int, Pedestrian LOS Score for Intersectio	2.044	1.998	2.354	2.439
Crosswalk LOS	B	A	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	567	567	1233	0
d_b, Bicycle Delay [s]	23.11	23.11	6.61	45.00
l_b,int, Bicycle LOS Score for Intersection	1.759	1.682	2.604	4.132
Bicycle LOS	A	A	B	D

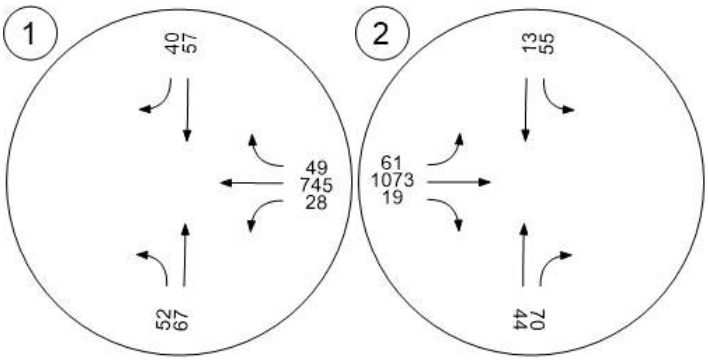
Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Traffic Volume - Base Volume





Intersection Level Of Service Report
Intersection 1: N Adair Street and N 4th Avenue

Control Type:	Signalized	Delay (sec / veh):	15.3
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.592

Intersection Setup

Name	N 4th Ave.			N 4th Ave.			N Adair St.			N Adair St.		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	1	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	49.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes						Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	N 4th Ave.			N 4th Ave.			N Adair St.			N Adair St.		
Base Volume Input [veh/h]	84	134	0	0	130	132	0	0	0	74	1442	93
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	3.00	2.00	0.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	12	0	0	0	0	0	8
Total Hourly Volume [veh/h]	84	134	0	0	130	120	0	0	0	74	1442	85
Peak Hour Factor	0.9500	0.9500	1.0000	1.0000	0.9500	0.9500	1.0000	1.0000	1.0000	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	35	0	0	34	32	0	0	0	19	379	22
Total Analysis Volume [veh/h]	88	141	0	0	137	126	0	0	0	78	1518	89
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			5			4			0		
v_di, Inbound Pedestrian Volume crossing m	0			4			5			0		
v_co, Outbound Pedestrian Volume crossing	1			3			1			3		
v_ci, Inbound Pedestrian Volume crossing mi	1			3			1			3		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	70.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	4	0	0	0	0	0	6	0
Auxiliary Signal Groups												
Maximum Green [s]	0	40	0	0	40	0	0	0	0	0	60	0
Amber [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	0.0	0.0	0.0	4.0	0.0
All red [s]	0.0	0.5	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.5	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	8	0
Pedestrian Clearance [s]	0	13	0	0	16	0	0	0	0	0	15	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.5	0.0	0.0	2.5	0.0	0.0	0.0	0.0	0.0	2.5	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	30	0	0	30	0	0	0	0	0	60	0
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	0	0	0	10	0
Vehicle Extension [s]	0.0	2.5	0.0	0.0	2.5	0.0	0.0	0.0	0.0	0.0	6.1	0.0
Minimum Recall		No			No						Yes	
Maximum Recall		No			No						No	
Pedestrian Recall		No			No						No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	C		C	C
C, Cycle Length [s]	90	90	90	90		90	90
L, Total Lost Time per Cycle [s]	4.50	4.50	4.50	4.50		4.50	4.50
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00		0.00	0.00
l2, Clearance Lost Time [s]	2.50	2.50	2.50	2.50		2.50	2.50
g_i, Effective Green Time [s]	18	18	18	18		63	63
g / C, Green / Cycle	0.20	0.20	0.20	0.20		0.70	0.70
(v / s)_i Volume / Saturation Flow Rate	0.08	0.07	0.07	0.08		0.45	0.46
s, saturation flow rate [veh/h]	1108	1900	1900	1604		1861	1835
c, Capacity [veh/h]	195	383	383	323		1300	1282
d1, Uniform Delay [s]	39.25	30.99	30.82	31.25		7.50	7.55
k, delay calibration	0.08	0.08	0.08	0.08		0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00
d2, Incremental Delay [s]	1.21	0.44	0.39	0.61		2.53	2.62
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00

Lane Group Results

X, volume / capacity	0.45	0.37	0.34	0.41		0.65	0.66
d, Delay for Lane Group [s/veh]	40.46	31.42	31.21	31.86		10.03	10.17
Lane Group LOS	D	C	C	C		B	B
Critical Lane Group	No	No	No	Yes		No	Yes
50th-Percentile Queue Length [veh/ln]	1.93	2.65	2.46	2.50		7.40	7.42
50th-Percentile Queue Length [ft/ln]	48.30	66.22	61.39	62.56		185.12	185.61
95th-Percentile Queue Length [veh/ln]	3.48	4.77	4.42	4.50		11.87	11.89
95th-Percentile Queue Length [ft/ln]	86.94	119.20	110.51	112.60		296.69	297.33

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	40.46	31.42	0.00	0.00	31.24	31.86	0.00	0.00	0.00	10.03	10.10	10.17
Movement LOS	D	C			C	C				B	B	B
d_A, Approach Delay [s/veh]	34.89			31.54			0.00			10.10		
Approach LOS	C			C			A			B		
d_I, Intersection Delay [s/veh]	15.30											
Intersection LOS	B											
Intersection V/C	0.592											

Emissions

Vehicle Miles Traveled [mph]	4.73	7.58	4.62	4.62		37.26	37.02
Stops [stops/h]	77.28	105.96	98.23	100.09		296.19	296.98
Fuel consumption [US gal/h]	1.35	1.80	1.57	1.60		5.97	5.98
CO [g/h]	94.10	125.76	109.62	111.55		417.28	418.11
NOx [g/h]	18.31	24.47	21.33	21.70		81.19	81.35
VOC [g/h]	21.81	29.15	25.41	25.85		96.71	96.90

Other Modes

g_Walk,mi, Effective Walk Time [s]	12.0	12.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	7804.64	2315.79	1070.56	0.00
d_p, Pedestrian Delay [s]	33.80	33.80	34.67	34.67
l_p,int, Pedestrian LOS Score for Intersectio	2.238	2.272	2.690	2.685
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	567	567	0	1233
d_b, Bicycle Delay [s]	23.11	23.11	45.00	6.61
l_b,int, Bicycle LOS Score for Intersection	1.937	1.786	4.132	2.956
Bicycle LOS	A	A	D	C

Sequence

Ring 1	6	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: W Baseline Street and N/S 4th Avenue

Control Type:	Signalized	Delay (sec / veh):	11.7
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.490

Intersection Setup

Name	S 4th Ave.			N 4th Ave.			W Baseline St.			W Baseline St.		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	1	0	0	0	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	140.00	100.00	100.00	100.00	100.00	100.00	66.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S 4th Ave.			N 4th Ave.			W Baseline St.			W Baseline St.		
Base Volume Input [veh/h]	0	69	52	98	107	0	148	1127	74	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	1.00	0.00	1.00	1.00	2.00	0.00	4.00	1.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	20	0	0	0	0	0	12	0	0	0
Total Hourly Volume [veh/h]	0	69	32	98	107	0	148	1127	62	0	0	0
Peak Hour Factor	1.0000	0.9500	0.9500	0.9500	0.9500	1.0000	0.9500	0.9500	0.9500	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	18	8	26	28	0	39	297	16	0	0	0
Total Analysis Volume [veh/h]	0	73	34	103	113	0	156	1186	65	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			4			4			0		
v_di, Inbound Pedestrian Volume crossing m	0			4			4			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	85.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	4	0	0	2	0	0	0	0
Auxiliary Signal Groups												
Maximum Green [s]	0	25	0	0	25	0	0	60	0	0	0	0
Amber [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	0.0	0.0
All red [s]	0.0	0.5	0.0	0.0	0.5	0.0	0.0	0.5	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	10	0	0	10	0	0	0	0
Pedestrian Clearance [s]	0	12	0	0	14	0	0	12	0	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.5	0.0	0.0	2.5	0.0	0.0	2.5	0.0	0.0	0.0	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	30	0	0	30	0	0	60	0	0	0	0
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	10	0	0	0	0
Vehicle Extension [s]	0.0	2.5	0.0	0.0	2.5	0.0	0.0	5.8	0.0	0.0	0.0	0.0
Minimum Recall		No			No			Yes				
Maximum Recall		No			No			No				
Pedestrian Recall		No			No			No				

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C	C	C	R	
C, Cycle Length [s]	90	90	90	90	90	90	90	
L, Total Lost Time per Cycle [s]	4.50	4.50	4.50	4.50	4.50	4.50	4.50	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.50	2.50	2.50	2.50	2.50	2.50	2.50	
g_i, Effective Green Time [s]	15	15	15	15	66	66	66	
g / C, Green / Cycle	0.17	0.17	0.17	0.17	0.73	0.73	0.73	
(v / s)_i Volume / Saturation Flow Rate	0.04	0.02	0.08	0.06	0.37	0.37	0.04	
s, saturation flow rate [veh/h]	1885	1615	1297	1885	1819	1840	1602	
c, Capacity [veh/h]	319	274	223	319	1329	1344	1171	
d1, Uniform Delay [s]	32.29	31.71	38.72	33.02	5.16	5.16	3.40	
k, delay calibration	0.08	0.08	0.08	0.08	0.50	0.50	0.50	
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.27	0.15	1.11	0.49	1.36	1.34	0.09	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	0.23	0.12	0.46	0.35	0.50	0.50	0.06	
d, Delay for Lane Group [s/veh]	32.56	31.86	39.84	33.52	6.52	6.49	3.50	
Lane Group LOS	C	C	D	C	A	A	A	
Critical Lane Group	No	No	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	1.38	0.63	2.23	2.19	4.59	4.62	0.29	
50th-Percentile Queue Length [ft/ln]	34.50	15.79	55.84	54.77	114.66	115.42	7.29	
95th-Percentile Queue Length [veh/ln]	2.48	1.14	4.02	3.94	8.10	8.14	0.52	
95th-Percentile Queue Length [ft/ln]	62.11	28.43	100.51	98.59	202.47	203.52	13.12	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	32.56	31.86	39.84	33.52	0.00	6.52	6.51	3.50	0.00	0.00	0.00
Movement LOS		C	C	D	C		A	A	A			
d_A, Approach Delay [s/veh]	32.34			36.53			6.37			0.00		
Approach LOS	C			D			A			A		
d_I, Intersection Delay [s/veh]	11.74											
Intersection LOS	B											
Intersection V/C	0.490											

Emissions

Vehicle Miles Traveled [mph]	3.51	1.63	5.54	6.08	46.96	47.40	4.57	
Stops [stops/h]	55.21	25.27	89.34	87.64	183.46	184.68	11.66	
Fuel consumption [US gal/h]	0.93	0.43	1.56	1.51	3.83	3.86	0.30	
CO [g/h]	65.22	29.87	108.80	105.20	267.97	270.01	20.89	
NOx [g/h]	12.69	5.81	21.17	20.47	52.14	52.53	4.06	
VOC [g/h]	15.12	6.92	25.22	24.38	62.11	62.58	4.84	

Other Modes

g_Walk,mi, Effective Walk Time [s]	14.0	14.0	14.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	2052.35	0.00
d_p, Pedestrian Delay [s]	32.09	32.09	32.09	34.67
l_p,int, Pedestrian LOS Score for Intersectio	2.068	2.081	2.415	2.516
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	567	567	1233	0
d_b, Bicycle Delay [s]	23.11	23.11	6.61	45.00
l_b,int, Bicycle LOS Score for Intersection	1.769	1.916	2.730	4.132
Bicycle LOS	A	A	B	D

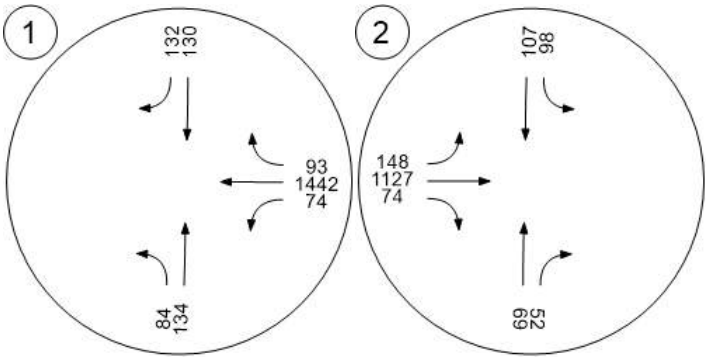
Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Traffic Volume - Base Volume





Appendix D:
2026 Background Traffic Conditions
Analysis Worksheets

Intersection Level Of Service Report
Intersection 1: N Adair Street and N 4th Avenue

Control Type:	Signalized	Delay (sec / veh):	10.6
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.353

Intersection Setup

Name	N 4th Ave.			N 4th Ave.			N Adair St.			N Adair St.		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	1	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	49.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes						Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	N 4th Ave.			N 4th Ave.			N Adair St.			N Adair St.		
Base Volume Input [veh/h]	54	70	0	0	59	42	0	0	0	29	775	51
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	8.00	8.00	2.00	2.00	5.00	10.00	2.00	2.00	2.00	7.00	9.00	4.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	12	0	0	0	0	0	0
Total Hourly Volume [veh/h]	54	70	0	0	59	30	0	0	0	29	775	51
Peak Hour Factor	0.9000	0.9000	1.0000	1.0000	0.9000	0.9000	1.0000	1.0000	1.0000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	19	0	0	16	8	0	0	0	8	215	14
Total Analysis Volume [veh/h]	60	78	0	0	66	33	0	0	0	32	861	57
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			2			2			0		
v_di, Inbound Pedestrian Volume crossing m	0			2			2			0		
v_co, Outbound Pedestrian Volume crossing	0			6			0			7		
v_ci, Inbound Pedestrian Volume crossing mi	0			7			0			6		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	50.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	4	0	0	0	0	0	6	0
Auxiliary Signal Groups												
Maximum Green [s]	0	40	0	0	40	0	0	0	0	0	60	0
Amber [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	0.0	0.0	0.0	4.0	0.0
All red [s]	0.0	0.5	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.5	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	8	0
Pedestrian Clearance [s]	0	13	0	0	16	0	0	0	0	0	15	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.5	0.0	0.0	2.5	0.0	0.0	0.0	0.0	0.0	2.5	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	30	0	0	30	0	0	0	0	0	60	0
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	0	0	0	10	0
Vehicle Extension [s]	0.0	2.5	0.0	0.0	2.5	0.0	0.0	0.0	0.0	0.0	6.1	0.0
Minimum Recall		No			No						Yes	
Maximum Recall		No			No						No	
Pedestrian Recall		No			No						No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	C		C	C
C, Cycle Length [s]	90	90	90	90		90	90
L, Total Lost Time per Cycle [s]	4.50	4.50	4.50	4.50		4.50	4.50
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00		0.00	0.00
l2, Clearance Lost Time [s]	2.50	2.50	2.50	2.50		2.50	2.50
g_i, Effective Green Time [s]	11	11	11	11		70	70
g / C, Green / Cycle	0.12	0.12	0.12	0.12		0.78	0.78
(v / s)_i Volume / Saturation Flow Rate	0.05	0.04	0.03	0.03		0.27	0.27
s, saturation flow rate [veh/h]	1225	1780	1825	1622		1759	1727
c, Capacity [veh/h]	165	217	223	198		1368	1343
d1, Uniform Delay [s]	41.01	36.26	35.64	35.77		3.05	3.05
k, delay calibration	0.08	0.08	0.08	0.08		0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00
d2, Incremental Delay [s]	1.00	0.74	0.37	0.48		0.71	0.72
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00

Lane Group Results

X, volume / capacity	0.36	0.36	0.22	0.25		0.35	0.35
d, Delay for Lane Group [s/veh]	42.02	37.01	36.01	36.25		3.76	3.78
Lane Group LOS	D	D	D	D		A	A
Critical Lane Group	Yes	No	No	No		No	Yes
50th-Percentile Queue Length [veh/ln]	1.33	1.60	0.99	1.00		1.73	1.70
50th-Percentile Queue Length [ft/ln]	33.32	40.00	24.82	25.00		43.14	42.51
95th-Percentile Queue Length [veh/ln]	2.40	2.88	1.79	1.80		3.11	3.06
95th-Percentile Queue Length [ft/ln]	59.97	72.00	44.68	45.01		77.65	76.52

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	42.02	37.01	0.00	0.00	36.07	36.25	0.00	0.00	0.00	3.76	3.77	3.78
Movement LOS	D	D			D	D				A	A	A
d_A, Approach Delay [s/veh]	39.18			36.13			0.00			3.77		
Approach LOS	D			D			A			A		
d_I, Intersection Delay [s/veh]	10.58											
Intersection LOS	B											
Intersection V/C	0.353											

Emissions

Vehicle Miles Traveled [mph]	3.23	4.19	1.74	1.74		21.12	20.75
Stops [stops/h]	53.31	64.00	39.72	40.01		69.02	68.02
Fuel consumption [US gal/h]	0.94	1.11	0.65	0.66		1.80	1.77
CO [g/h]	65.73	77.84	45.70	45.98		125.93	123.95
NOx [g/h]	12.79	15.14	8.89	8.95		24.50	24.12
VOC [g/h]	15.23	18.04	10.59	10.66		29.18	28.73

Other Modes

g_Walk,mi, Effective Walk Time [s]	12.0	12.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	1118.22	3064.32	0.00
d_p, Pedestrian Delay [s]	33.80	33.80	34.67	34.67
l_p,int, Pedestrian LOS Score for Intersectio	2.187	2.207	2.271	2.351
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	567	567	0	1233
d_b, Bicycle Delay [s]	23.11	23.11	45.00	6.61
l_b,int, Bicycle LOS Score for Intersection	1.787	1.651	4.132	2.343
Bicycle LOS	A	A	D	B

Sequence

Ring 1	6	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: W Baseline Street and N/S 4th Avenue

Control Type:	Signalized	Delay (sec / veh):	8.1
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.450

Intersection Setup

Name	S 4th Ave.			N 4th Ave.			W Baseline St.			W Baseline St.		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	1	0	0	0	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	140.00	100.00	100.00	100.00	100.00	100.00	66.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S 4th Ave.			N 4th Ave.			W Baseline St.			W Baseline St.		
Base Volume Input [veh/h]	0	46	73	57	14	0	63	1116	20	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	1.00	16.00	8.00	2.00	5.00	5.00	5.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	40	0	0	0	0	0	4	0	0	0
Total Hourly Volume [veh/h]	0	46	33	57	14	0	63	1116	16	0	0	0
Peak Hour Factor	1.0000	0.9100	0.9100	0.9100	0.9100	1.0000	0.9100	0.9100	0.9100	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	13	9	16	4	0	17	307	4	0	0	0
Total Analysis Volume [veh/h]	0	51	36	63	15	0	69	1226	18	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	1			2			2			1		
v_di, Inbound Pedestrian Volume crossing m	1			2			2			1		
v_co, Outbound Pedestrian Volume crossing	1			1			1			0		
v_ci, Inbound Pedestrian Volume crossing mi	1			0			1			1		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	85.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	4	0	0	2	0	0	0	0
Auxiliary Signal Groups												
Maximum Green [s]	0	25	0	0	25	0	0	60	0	0	0	0
Amber [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	0.0	0.0
All red [s]	0.0	0.5	0.0	0.0	0.5	0.0	0.0	0.5	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	10	0	0	10	0	0	0	0
Pedestrian Clearance [s]	0	12	0	0	14	0	0	12	0	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.5	0.0	0.0	2.5	0.0	0.0	2.5	0.0	0.0	0.0	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	30	0	0	30	0	0	60	0	0	0	0
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	10	0	0	0	0
Vehicle Extension [s]	0.0	2.5	0.0	0.0	2.5	0.0	0.0	5.8	0.0	0.0	0.0	0.0
Minimum Recall		No			No			Yes				
Maximum Recall		No			No			No				
Pedestrian Recall		No			No			No				

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C	C	C	R	
C, Cycle Length [s]	90	90	90	90	90	90	90	
L, Total Lost Time per Cycle [s]	4.50	4.50	4.50	4.50	4.50	4.50	4.50	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.50	2.50	2.50	2.50	2.50	2.50	2.50	
g_i, Effective Green Time [s]	10	10	10	10	71	71	71	
g / C, Green / Cycle	0.12	0.12	0.12	0.12	0.78	0.78	0.78	
(v / s)_i Volume / Saturation Flow Rate	0.03	0.02	0.05	0.01	0.36	0.36	0.01	
s, saturation flow rate [veh/h]	1870	1594	1159	1780	1815	1825	1549	
c, Capacity [veh/h]	217	185	157	207	1423	1431	1214	
d1, Uniform Delay [s]	36.14	35.97	41.46	35.46	3.26	3.26	2.13	
k, delay calibration	0.08	0.08	0.08	0.08	0.50	0.50	0.50	
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.41	0.38	1.22	0.11	1.05	1.04	0.02	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	0.23	0.19	0.40	0.07	0.45	0.45	0.01	
d, Delay for Lane Group [s/veh]	36.55	36.34	42.69	35.57	4.31	4.30	2.15	
Lane Group LOS	D	D	D	D	A	A	A	
Critical Lane Group	No	No	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	1.03	0.73	1.42	0.30	2.94	2.95	0.05	
50th-Percentile Queue Length [ft/ln]	25.79	18.17	35.39	7.42	73.56	73.82	1.34	
95th-Percentile Queue Length [veh/ln]	1.86	1.31	2.55	0.53	5.30	5.32	0.10	
95th-Percentile Queue Length [ft/ln]	46.43	32.71	63.71	13.36	132.41	132.88	2.40	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	36.55	36.34	42.69	35.57	0.00	4.31	4.30	2.15	0.00	0.00	0.00
Movement LOS		D	D	D	D		A	A	A			
d_A, Approach Delay [s/veh]	36.47			41.32			4.28			0.00		
Approach LOS	D			D			A			A		
d_I, Intersection Delay [s/veh]	8.13											
Intersection LOS	A											
Intersection V/C	0.450											

Emissions

Vehicle Miles Traveled [mph]	2.45	1.73	3.39	0.81	45.43	45.64	1.27	
Stops [stops/h]	41.27	29.07	56.63	11.88	117.70	118.12	2.14	
Fuel consumption [US gal/h]	0.71	0.50	1.00	0.21	3.09	3.10	0.07	
CO [g/h]	49.50	34.81	69.87	14.50	215.77	216.66	5.02	
NOx [g/h]	9.63	6.77	13.59	2.82	41.98	42.15	0.98	
VOC [g/h]	11.47	8.07	16.19	3.36	50.01	50.21	1.16	

Other Modes

g_Walk,mi, Effective Walk Time [s]	14.0	14.0	14.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	4107.86	0.00
d_p, Pedestrian Delay [s]	32.09	32.09	32.09	34.67
l_p,int, Pedestrian LOS Score for Intersectio	2.047	2.001	2.370	2.469
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	567	567	1233	0
d_b, Bicycle Delay [s]	23.11	23.11	6.61	45.00
l_b,int, Bicycle LOS Score for Intersection	1.769	1.688	2.646	4.132
Bicycle LOS	A	A	B	D

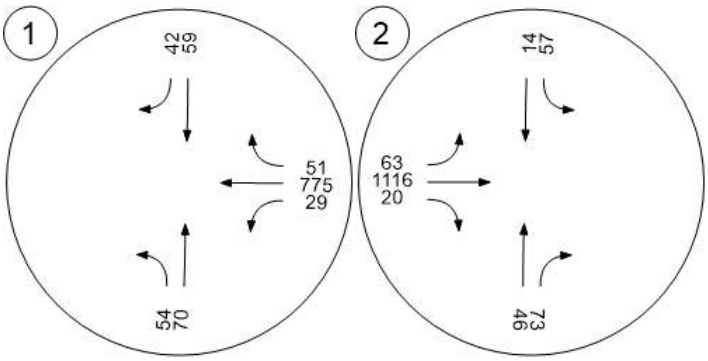
Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Traffic Volume - Base Volume





Intersection Level Of Service Report
Intersection 1: N Adair Street and N 4th Avenue

Control Type:	Signalized	Delay (sec / veh):	16.0
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.617

Intersection Setup

Name	N 4th Ave.			N 4th Ave.			N Adair St.			N Adair St.		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	1	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	49.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes						Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	N 4th Ave.			N 4th Ave.			N Adair St.			N Adair St.		
Base Volume Input [veh/h]	87	139	0	0	135	137	0	0	0	77	1500	97
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	3.00	2.00	0.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	12	0	0	0	0	0	8
Total Hourly Volume [veh/h]	87	139	0	0	135	125	0	0	0	77	1500	89
Peak Hour Factor	0.9500	0.9500	1.0000	1.0000	0.9500	0.9500	1.0000	1.0000	1.0000	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	37	0	0	36	33	0	0	0	20	395	23
Total Analysis Volume [veh/h]	92	146	0	0	142	132	0	0	0	81	1579	94
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			5			4			0		
v_di, Inbound Pedestrian Volume crossing m	0			4			5			0		
v_co, Outbound Pedestrian Volume crossing	1			3			1			3		
v_ci, Inbound Pedestrian Volume crossing mi	1			3			1			3		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	70.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	4	0	0	0	0	0	6	0
Auxiliary Signal Groups												
Maximum Green [s]	0	40	0	0	40	0	0	0	0	0	60	0
Amber [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	0.0	0.0	0.0	4.0	0.0
All red [s]	0.0	0.5	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.5	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	8	0
Pedestrian Clearance [s]	0	13	0	0	16	0	0	0	0	0	15	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.5	0.0	0.0	2.5	0.0	0.0	0.0	0.0	0.0	2.5	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	30	0	0	30	0	0	0	0	0	60	0
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	0	0	0	10	0
Vehicle Extension [s]	0.0	2.5	0.0	0.0	2.5	0.0	0.0	0.0	0.0	0.0	6.1	0.0
Minimum Recall		No			No						Yes	
Maximum Recall		No			No						No	
Pedestrian Recall		No			No						No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	C		C	C
C, Cycle Length [s]	90	90	90	90		90	90
L, Total Lost Time per Cycle [s]	4.50	4.50	4.50	4.50		4.50	4.50
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00		0.00	0.00
l2, Clearance Lost Time [s]	2.50	2.50	2.50	2.50		2.50	2.50
g_i, Effective Green Time [s]	19	19	19	19		62	62
g / C, Green / Cycle	0.21	0.21	0.21	0.21		0.69	0.69
(v / s)_i Volume / Saturation Flow Rate	0.08	0.08	0.07	0.09		0.47	0.48
s, saturation flow rate [veh/h]	1098	1900	1900	1604		1861	1835
c, Capacity [veh/h]	199	397	397	335		1287	1268
d1, Uniform Delay [s]	39.02	30.52	30.37	30.81		8.13	8.20
k, delay calibration	0.08	0.08	0.08	0.08		0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00
d2, Incremental Delay [s]	1.23	0.42	0.38	0.60		2.96	3.09
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00

Lane Group Results

X, volume / capacity	0.46	0.37	0.35	0.41		0.68	0.69
d, Delay for Lane Group [s/veh]	40.25	30.95	30.75	31.41		11.08	11.28
Lane Group LOS	D	C	C	C		B	B
Critical Lane Group	No	No	No	Yes		No	Yes
50th-Percentile Queue Length [veh/ln]	2.02	2.72	2.54	2.59		8.33	8.39
50th-Percentile Queue Length [ft/ln]	50.44	68.03	63.48	64.72		208.33	209.73
95th-Percentile Queue Length [veh/ln]	3.63	4.90	4.57	4.66		13.07	13.14
95th-Percentile Queue Length [ft/ln]	90.79	122.45	114.26	116.49		326.69	328.48

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	40.25	30.95	0.00	0.00	30.77	31.41	0.00	0.00	0.00	11.08	11.18	11.28
Movement LOS	D	C			C	C				B	B	B
d_A, Approach Delay [s/veh]	34.54			31.08			0.00			11.18		
Approach LOS	C			C			A			B		
d_I, Intersection Delay [s/veh]	16.04											
Intersection LOS	B											
Intersection V/C	0.617											

Emissions

Vehicle Miles Traveled [mph]	4.95	7.85	4.82	4.82		38.76	38.56
Stops [stops/h]	80.70	108.85	101.57	103.55		333.33	335.56
Fuel consumption [US gal/h]	1.40	1.84	1.62	1.65		6.65	6.69
CO [g/h]	98.07	128.89	113.01	115.05		464.55	467.38
NOx [g/h]	19.08	25.08	21.99	22.39		90.38	90.93
VOC [g/h]	22.73	29.87	26.19	26.66		107.66	108.32

Other Modes

g_Walk,mi, Effective Walk Time [s]	12.0	12.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	7804.64	2298.74	1046.55	0.00
d_p, Pedestrian Delay [s]	33.80	33.80	34.67	34.67
l_p,int, Pedestrian LOS Score for Intersectio	2.242	2.277	2.730	2.715
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	567	567	0	1233
d_b, Bicycle Delay [s]	23.11	23.11	45.00	6.61
l_b,int, Bicycle LOS Score for Intersection	1.952	1.796	4.132	3.013
Bicycle LOS	A	A	D	C

Sequence

Ring 1	6	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: W Baseline Street and N/S 4th Avenue

Control Type:	Signalized	Delay (sec / veh):	12.0
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.511

Intersection Setup

Name	S 4th Ave.			N 4th Ave.			W Baseline St.			W Baseline St.		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	1	0	0	0	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	140.00	100.00	100.00	100.00	100.00	100.00	66.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S 4th Ave.			N 4th Ave.			W Baseline St.			W Baseline St.		
Base Volume Input [veh/h]	0	72	54	102	111	0	154	1173	77	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	1.00	0.00	1.00	1.00	2.00	0.00	4.00	1.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	20	0	0	0	0	0	12	0	0	0
Total Hourly Volume [veh/h]	0	72	34	102	111	0	154	1173	65	0	0	0
Peak Hour Factor	1.0000	0.9500	0.9500	0.9500	0.9500	1.0000	0.9500	0.9500	0.9500	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	19	9	27	29	0	41	309	17	0	0	0
Total Analysis Volume [veh/h]	0	76	36	107	117	0	162	1235	68	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			4			4			0		
v_di, Inbound Pedestrian Volume crossing m	0			4			4			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	85.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	4	0	0	2	0	0	0	0
Auxiliary Signal Groups												
Maximum Green [s]	0	25	0	0	25	0	0	60	0	0	0	0
Amber [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	0.0	0.0
All red [s]	0.0	0.5	0.0	0.0	0.5	0.0	0.0	0.5	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	10	0	0	10	0	0	0	0
Pedestrian Clearance [s]	0	12	0	0	14	0	0	12	0	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.5	0.0	0.0	2.5	0.0	0.0	2.5	0.0	0.0	0.0	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	30	0	0	30	0	0	60	0	0	0	0
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	10	0	0	0	0
Vehicle Extension [s]	0.0	2.5	0.0	0.0	2.5	0.0	0.0	5.8	0.0	0.0	0.0	0.0
Minimum Recall		No			No			Yes				
Maximum Recall		No			No			No				
Pedestrian Recall		No			No			No				

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C	C	C	R	
C, Cycle Length [s]	90	90	90	90	90	90	90	
L, Total Lost Time per Cycle [s]	4.50	4.50	4.50	4.50	4.50	4.50	4.50	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.50	2.50	2.50	2.50	2.50	2.50	2.50	
g_i, Effective Green Time [s]	16	16	16	16	65	65	65	
g / C, Green / Cycle	0.17	0.17	0.17	0.17	0.73	0.73	0.73	
(v / s)_i Volume / Saturation Flow Rate	0.04	0.02	0.08	0.06	0.38	0.38	0.04	
s, saturation flow rate [veh/h]	1885	1615	1291	1885	1819	1840	1602	
c, Capacity [veh/h]	328	281	226	328	1321	1336	1164	
d1, Uniform Delay [s]	32.01	31.42	38.59	32.75	5.46	5.45	3.52	
k, delay calibration	0.08	0.08	0.08	0.08	0.50	0.50	0.50	
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.27	0.15	1.14	0.49	1.51	1.48	0.10	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	0.23	0.13	0.47	0.36	0.53	0.53	0.06	
d, Delay for Lane Group [s/veh]	32.27	31.57	39.73	33.24	6.97	6.93	3.62	
Lane Group LOS	C	C	D	C	A	A	A	
Critical Lane Group	No	No	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	1.43	0.67	2.32	2.26	5.03	5.06	0.31	
50th-Percentile Queue Length [ft/ln]	35.75	16.64	58.00	56.48	125.78	126.46	7.84	
95th-Percentile Queue Length [veh/ln]	2.57	1.20	4.18	4.07	8.71	8.75	0.56	
95th-Percentile Queue Length [ft/ln]	64.36	29.95	104.39	101.66	217.75	218.68	14.11	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	32.27	31.57	39.73	33.24	0.00	6.97	6.95	3.62	0.00	0.00	0.00
Movement LOS		C	C	D	C		A	A	A			
d_A, Approach Delay [s/veh]	32.05			36.34			6.80			0.00		
Approach LOS	C			D			A			A		
d_I, Intersection Delay [s/veh]	12.04											
Intersection LOS	B											
Intersection V/C	0.511											

Emissions

Vehicle Miles Traveled [mph]	3.65	1.73	5.75	6.29	48.91	49.33	4.78	
Stops [stops/h]	57.21	26.62	92.79	90.37	201.25	202.34	12.54	
Fuel consumption [US gal/h]	0.97	0.45	1.61	1.55	4.11	4.14	0.32	
CO [g/h]	67.48	31.42	112.85	108.31	287.39	289.27	22.10	
NOx [g/h]	13.13	6.11	21.96	21.07	55.92	56.28	4.30	
VOC [g/h]	15.64	7.28	26.15	25.10	66.61	67.04	5.12	

Other Modes

g_Walk,mi, Effective Walk Time [s]	14.0	14.0	14.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	2052.35	0.00
d_p, Pedestrian Delay [s]	32.09	32.09	32.09	34.67
l_p,int, Pedestrian LOS Score for Intersectio	2.072	2.087	2.434	2.548
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	567	567	1233	0
d_b, Bicycle Delay [s]	23.11	23.11	6.61	45.00
l_b,int, Bicycle LOS Score for Intersection	1.777	1.929	2.778	4.132
Bicycle LOS	A	A	C	D

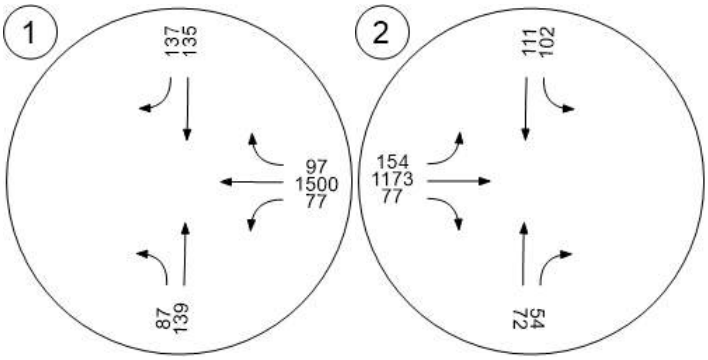
Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Traffic Volume - Base Volume





Appendix E:
Trip Generation/Queuing Study

Table 1: Observed Trip Rates (per 1000 SF)

			AM Peak Hour			PM Peak Hour		
Site	Size (SF)	Daily	TOTAL	IN	OUT	TOTAL	IN	OUT
Tanasbourne	4,962	-	26.60	51%	49%	60.46	50%	50%
Beaverton-Hillsdale	4,845	-	12.38	50%	50%	47.06	53%	47%
Cedars Hills	4,815	-	13.50	55%	45%	38.21	48%	52%
TV Highway	5,166	-	12.39	56%	44%	30.97	54%	46%
Keizer Station	5,199	624.74	15.96	53%	47%	57.90	57%	43%
Average		**624.74**	**16.17**	**53%**	**47%**	**46.92**	**52%**	**48%**

Table 2: Observed Trip Rates (per 1000 SF)

			AM Peak Hour			PM Peak Hour		
Site	Size (SF)	Daily	TOTAL	IN	OUT	TOTAL	IN	OUT
Tanasbourne	4,962	-	26.60	51%	49%	60.46	50%	50%
Beaverton-Hillsdale	4,845	-	12.38	50%	50%	47.06	53%	47%
Keizer Station	5,199	624.74	15.96	53%	47%	57.90	57%	43%
Average		**624.74**	**18.32**	**51%**	**49%**	**55.14**	**53%**	**47%**

Table 3: Observed Portland Area CFA AM Peak Hour Queuing

Site	95th Percentile Queue	Max Queue
Tanasbourne	7	8
Beaverton-Hillsdale	4	6
Cedars Hills	6	8
TV Highway	7	7

Table 4: Observed Portland Area CFA Mid-day Peak Hour Queuing

Site	95th Percentile Queue	Max Queue
Tanasbourne	23	24
Beaverton-Hillsdale	22	23
Cedars Hills	13	14
TV Highway	16	19

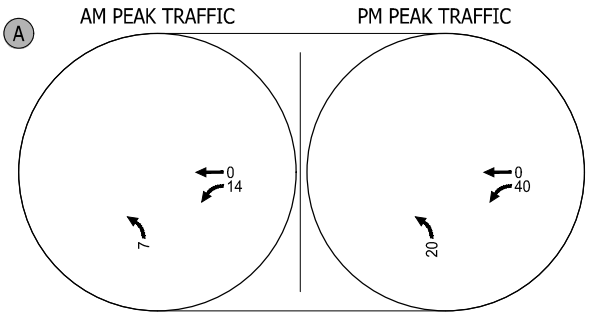
Table 5: Observed Portland Area CFA PM Peak Hour Queuing

Site	95th Percentile Queue	Max Queue
Tanasbourne	25	29
Beaverton-Hillsdale	21	22
Cedars Hills	15	18
TV Highway	15	16

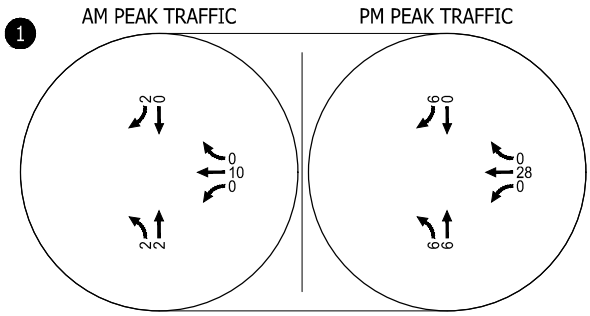
Appendix F:
Trip Assignment Figures



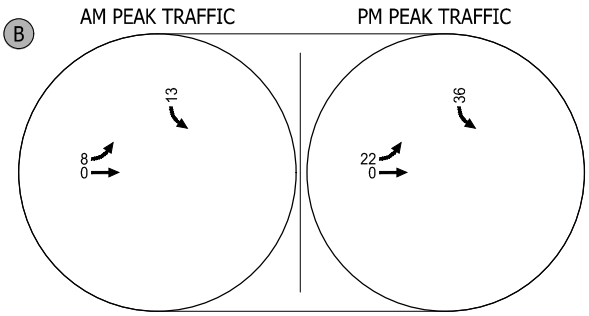
PROPOSED SITE ACCESS DRIVEWAY/
N ADAIR STREET



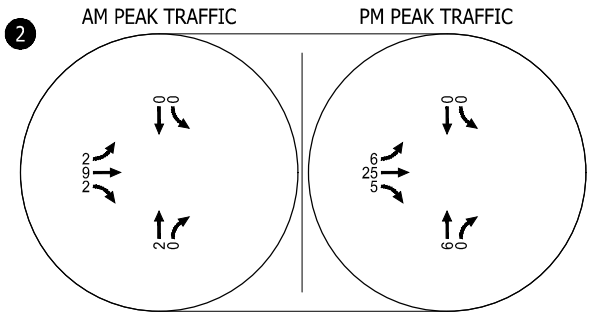
N ADAIR STREET /
N 4TH AVENUE



PROPOSED SITE ACCESS DRIVEWAY/
W BASELINE STREET



W BASELINE STREET /
N/S 4TH AVENUE



Estimated Net New Site-Generated Trip Assignment
AM & PM Peak Hours
Washington County, OR

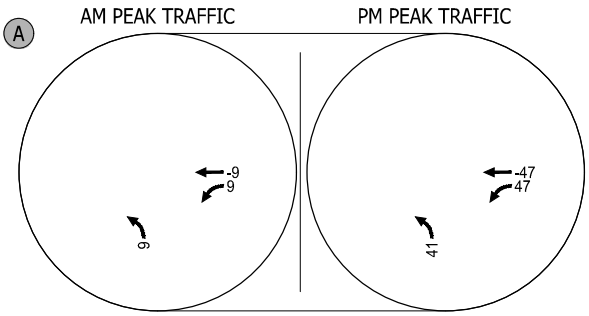
Figure
F-1

XX - TRIP DISTRIBUTION

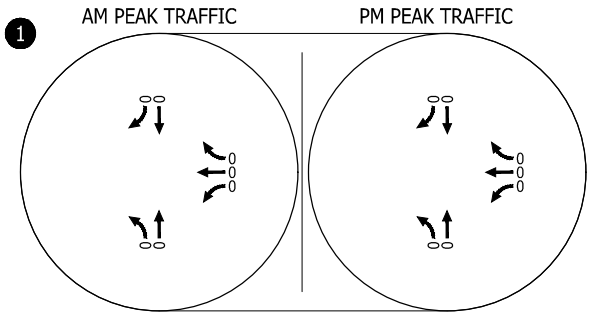
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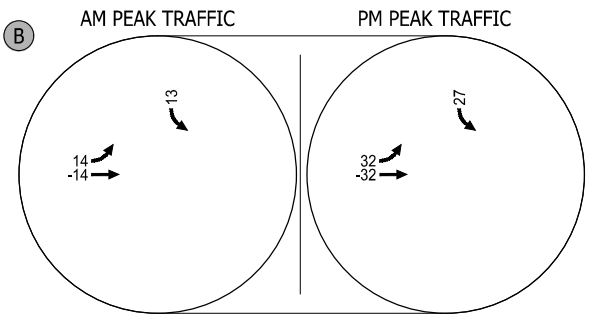
PROPOSED SITE ACCESS DRIVEWAY/
N ADAIR STREET



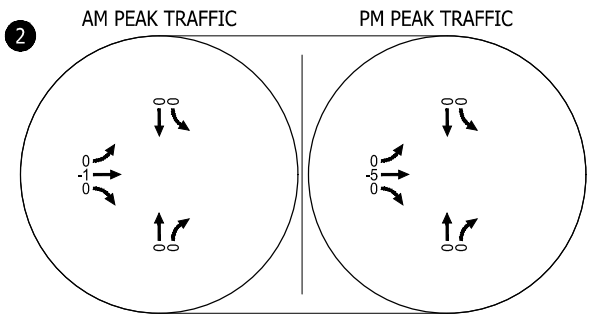
N ADAIR STREET /
N 4TH AVENUE



PROPOSED SITE ACCESS DRIVEWAY/
W BASELINE STREET



W BASELINE STREET /
N/S 4TH AVENUE



Estimated Pass-By Trip Assignment
AM & PM Peak Hours
Washington County, OR

Figure
F-2

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Appendix G:

2026 Total Traffic Condition Analysis Worksheets

Intersection Level Of Service Report
Intersection 1: N Adair Street and N 4th Avenue

Control Type:	Signalized	Delay (sec / veh):	10.7
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.359

Intersection Setup

Name	N 4th Ave.			N 4th Ave.			N Adair St.			N Adair St.		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	1	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	49.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes						Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	N 4th Ave.			N 4th Ave.			N Adair St.			N Adair St.		
Base Volume Input [veh/h]	56	72	0	0	59	44	0	0	0	29	786	51
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	8.00	8.00	2.00	2.00	5.00	10.00	2.00	2.00	2.00	7.00	9.00	4.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	12	0	0	0	0	0	0
Total Hourly Volume [veh/h]	56	72	0	0	59	32	0	0	0	29	786	51
Peak Hour Factor	0.9000	0.9000	1.0000	1.0000	0.9000	0.9000	1.0000	1.0000	1.0000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	16	20	0	0	16	9	0	0	0	8	218	14
Total Analysis Volume [veh/h]	62	80	0	0	66	36	0	0	0	32	873	57
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			2			2			0		
v_di, Inbound Pedestrian Volume crossing m	0			2			2			0		
v_co, Outbound Pedestrian Volume crossing	0			6			0			7		
v_ci, Inbound Pedestrian Volume crossing mi	0			7			0			6		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	50.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	4	0	0	0	0	0	6	0
Auxiliary Signal Groups												
Maximum Green [s]	0	40	0	0	40	0	0	0	0	0	60	0
Amber [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	0.0	0.0	0.0	4.0	0.0
All red [s]	0.0	0.5	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.5	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	8	0
Pedestrian Clearance [s]	0	13	0	0	16	0	0	0	0	0	15	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.5	0.0	0.0	2.5	0.0	0.0	0.0	0.0	0.0	2.5	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	30	0	0	30	0	0	0	0	0	60	0
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	0	0	0	10	0
Vehicle Extension [s]	0.0	2.5	0.0	0.0	2.5	0.0	0.0	0.0	0.0	0.0	6.1	0.0
Minimum Recall		No			No						Yes	
Maximum Recall		No			No						No	
Pedestrian Recall		No			No						No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	C		C	C
C, Cycle Length [s]	90	90	90	90		90	90
L, Total Lost Time per Cycle [s]	4.50	4.50	4.50	4.50		4.50	4.50
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00		0.00	0.00
l2, Clearance Lost Time [s]	2.50	2.50	2.50	2.50		2.50	2.50
g_i, Effective Green Time [s]	11	11	11	11		70	70
g / C, Green / Cycle	0.13	0.13	0.13	0.13		0.77	0.77
(v / s)_i Volume / Saturation Flow Rate	0.05	0.04	0.03	0.03		0.28	0.28
s, saturation flow rate [veh/h]	1222	1780	1825	1611		1759	1727
c, Capacity [veh/h]	167	223	229	202		1362	1338
d1, Uniform Delay [s]	40.88	36.04	35.41	35.54		3.16	3.16
k, delay calibration	0.08	0.08	0.08	0.08		0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00
d2, Incremental Delay [s]	1.01	0.72	0.36	0.48		0.73	0.74
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00

Lane Group Results

X, volume / capacity	0.37	0.36	0.22	0.25		0.36	0.36
d, Delay for Lane Group [s/veh]	41.90	36.76	35.77	36.02		3.89	3.90
Lane Group LOS	D	D	D	D		A	A
Critical Lane Group	Yes	No	No	No		No	Yes
50th-Percentile Queue Length [veh/ln]	1.38	1.64	1.02	1.03		1.81	1.78
50th-Percentile Queue Length [ft/ln]	34.39	40.88	25.48	25.68		45.26	44.61
95th-Percentile Queue Length [veh/ln]	2.48	2.94	1.83	1.85		3.26	3.21
95th-Percentile Queue Length [ft/ln]	61.90	73.58	45.86	46.22		81.47	80.30

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	41.90	36.76	0.00	0.00	35.82	36.02	0.00	0.00	0.00	3.89	3.90	3.90
Movement LOS	D	D			D	D				A	A	A
d_A, Approach Delay [s/veh]	39.00			35.89			0.00			3.90		
Approach LOS	D			D			A			A		
d_I, Intersection Delay [s/veh]	10.74											
Intersection LOS	B											
Intersection V/C	0.359											

Emissions

Vehicle Miles Traveled [mph]	3.33	4.30	2.38	2.38		44.37	43.60
Stops [stops/h]	55.02	65.41	40.77	41.08		72.42	71.38
Fuel consumption [US gal/h]	0.97	1.14	0.69	0.70		2.68	2.64
CO [g/h]	67.79	79.46	48.54	48.84		187.67	184.66
NOx [g/h]	13.19	15.46	9.44	9.50		36.51	35.93
VOC [g/h]	15.71	18.42	11.25	11.32		43.50	42.80

Other Modes

g_Walk,mi, Effective Walk Time [s]	12.0	12.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	1118.22	3037.30	0.00
d_p, Pedestrian Delay [s]	33.80	33.80	34.67	34.67
l_p,int, Pedestrian LOS Score for Intersectio	2.188	2.208	2.282	2.357
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	567	567	0	1233
d_b, Bicycle Delay [s]	23.11	23.11	45.00	6.61
l_b,int, Bicycle LOS Score for Intersection	1.794	1.654	4.132	2.353
Bicycle LOS	A	A	D	B

Sequence

Ring 1	6	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: W Baseline Street and N/S 4th Avenue

Control Type:	Signalized	Delay (sec / veh):	8.2
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.454

Intersection Setup

Name	S 4th Ave.			N 4th Ave.			W Baseline St.			W Baseline St.		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	1	0	0	0	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	140.00	100.00	100.00	100.00	100.00	100.00	66.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S 4th Ave.			N 4th Ave.			W Baseline St.			W Baseline St.		
Base Volume Input [veh/h]	0	48	73	57	14	0	65	1125	22	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	1.00	16.00	8.00	2.00	5.00	5.00	5.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	40	0	0	0	0	0	4	0	0	0
Total Hourly Volume [veh/h]	0	48	33	57	14	0	65	1125	18	0	0	0
Peak Hour Factor	1.0000	0.9100	0.9100	0.9100	0.9100	1.0000	0.9100	0.9100	0.9100	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	13	9	16	4	0	18	309	5	0	0	0
Total Analysis Volume [veh/h]	0	53	36	63	15	0	71	1236	20	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	1			2			2			1		
v_di, Inbound Pedestrian Volume crossing m	1			2			2			1		
v_co, Outbound Pedestrian Volume crossing	1			1			1			0		
v_ci, Inbound Pedestrian Volume crossing mi	1			0			1			1		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	85.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	4	0	0	2	0	0	0	0
Auxiliary Signal Groups												
Maximum Green [s]	0	25	0	0	25	0	0	60	0	0	0	0
Amber [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	0.0	0.0
All red [s]	0.0	0.5	0.0	0.0	0.5	0.0	0.0	0.5	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	10	0	0	10	0	0	0	0
Pedestrian Clearance [s]	0	12	0	0	14	0	0	12	0	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.5	0.0	0.0	2.5	0.0	0.0	2.5	0.0	0.0	0.0	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	30	0	0	30	0	0	60	0	0	0	0
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	10	0	0	0	0
Vehicle Extension [s]	0.0	2.5	0.0	0.0	2.5	0.0	0.0	5.8	0.0	0.0	0.0	0.0
Minimum Recall		No			No			Yes				
Maximum Recall		No			No			No				
Pedestrian Recall		No			No			No				

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C	C	C	R	
C, Cycle Length [s]	90	90	90	90	90	90	90	
L, Total Lost Time per Cycle [s]	4.50	4.50	4.50	4.50	4.50	4.50	4.50	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.50	2.50	2.50	2.50	2.50	2.50	2.50	
g_i, Effective Green Time [s]	11	11	11	11	70	70	70	
g / C, Green / Cycle	0.12	0.12	0.12	0.12	0.78	0.78	0.78	
(v / s)_i Volume / Saturation Flow Rate	0.03	0.02	0.05	0.01	0.36	0.36	0.01	
s, saturation flow rate [veh/h]	1870	1594	1157	1780	1815	1825	1549	
c, Capacity [veh/h]	219	187	157	208	1421	1429	1213	
d1, Uniform Delay [s]	36.11	35.89	41.47	35.38	3.31	3.31	2.15	
k, delay calibration	0.08	0.08	0.08	0.08	0.50	0.50	0.50	
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.42	0.37	1.23	0.11	1.07	1.06	0.02	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	0.24	0.19	0.40	0.07	0.46	0.46	0.02	
d, Delay for Lane Group [s/veh]	36.53	36.26	42.70	35.49	4.38	4.37	2.17	
Lane Group LOS	D	D	D	D	A	A	A	
Critical Lane Group	No	No	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	1.07	0.73	1.42	0.30	3.01	3.02	0.06	
50th-Percentile Queue Length [ft/ln]	26.80	18.14	35.40	7.41	75.27	75.53	1.50	
95th-Percentile Queue Length [veh/ln]	1.93	1.31	2.55	0.53	5.42	5.44	0.11	
95th-Percentile Queue Length [ft/ln]	48.25	32.66	63.72	13.34	135.48	135.96	2.70	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	36.53	36.26	42.70	35.49	0.00	4.38	4.37	2.17	0.00	0.00	0.00
Movement LOS		D	D	D	D		A	A	A			
d_A, Approach Delay [s/veh]	36.42			41.31			4.34			0.00		
Approach LOS	D			D			A			A		
d_I, Intersection Delay [s/veh]	8.18											
Intersection LOS	A											
Intersection V/C	0.454											

Emissions

Vehicle Miles Traveled [mph]	3.65	2.48	3.39	0.81	45.85	46.06	1.41	
Stops [stops/h]	42.89	29.03	56.64	11.86	120.43	120.85	2.40	
Fuel consumption [US gal/h]	0.78	0.53	1.00	0.21	3.13	3.15	0.08	
CO [g/h]	54.61	36.91	69.89	14.47	219.02	219.92	5.59	
NOx [g/h]	10.62	7.18	13.60	2.82	42.61	42.79	1.09	
VOC [g/h]	12.66	8.56	16.20	3.35	50.76	50.97	1.30	

Other Modes

g_Walk,mi, Effective Walk Time [s]	14.0	14.0	14.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	4107.86	0.00
d_p, Pedestrian Delay [s]	32.09	32.09	32.09	34.67
l_p,int, Pedestrian LOS Score for Intersectio	2.048	2.002	2.375	2.474
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	567	567	1233	0
d_b, Bicycle Delay [s]	23.11	23.11	6.61	45.00
l_b,int, Bicycle LOS Score for Intersection	1.772	1.688	2.658	4.132
Bicycle LOS	A	A	B	D

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 3: Site Access A

Control Type:	Two-way stop	Delay (sec / veh):	13.1
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.039

Intersection Setup

Name	Site Access A				N Adair St.	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name	Site Access A				N Adair St.	
Base Volume Input [veh/h]	16	0	0	0	24	862
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	2.00	2.00	2.00	0.00	9.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	16	0	0	0	24	862
Peak Hour Factor	0.9000	1.0000	1.0000	1.0000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	0	0	0	7	239
Total Analysis Volume [veh/h]	18	0	0	0	27	958
Pedestrian Volume [ped/h]	5		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.00	0.00	0.00	0.02	0.01
d_M, Delay for Movement [s/veh]	13.05	0.00	0.00	0.00	7.25	0.00
Movement LOS	B				A	A
95th-Percentile Queue Length [veh/ln]	0.12	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	3.01	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	13.05		0.00		0.20	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	0.43					
Intersection LOS	B					

Intersection Level Of Service Report
Intersection 4: Site Access B

Control Type:	Two-way stop	Delay (sec / veh):	15.7
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.082

Intersection Setup

Name	Site Access		W Baseline St.		W Baseline St.	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name	Site Access		W Baseline St.		W Baseline St.	
Base Volume Input [veh/h]	27	0	22	1185	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	2.00	0.00	5.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	27	0	22	1185	0	0
Peak Hour Factor	0.9100	1.0000	0.9100	0.9100	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	0	6	326	0	0
Total Analysis Volume [veh/h]	30	0	24	1302	0	0
Pedestrian Volume [ped/h]	5		0		0	

Intersection Settings

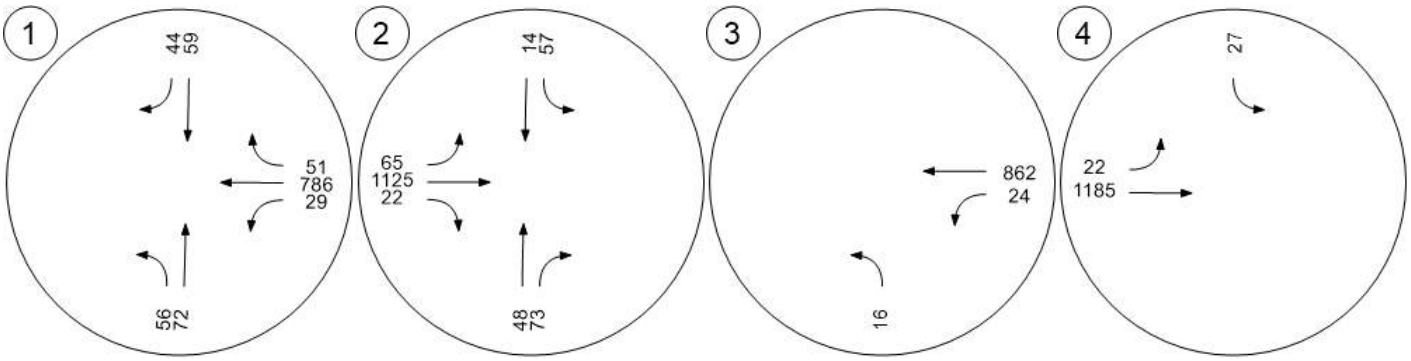
Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.08	0.00	0.01	0.01	0.00	0.00
d_M, Delay for Movement [s/veh]	15.74	0.00	7.25	0.00	0.00	0.00
Movement LOS	C		A	A		
95th-Percentile Queue Length [veh/ln]	0.27	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	6.67	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	15.74		0.13		0.00	
Approach LOS	C		A		A	
d_I, Intersection Delay [s/veh]	0.48					
Intersection LOS	C					

Traffic Volume - Base Volume





Intersection Level Of Service Report
Intersection 1: N Adair Street and N 4th Avenue

Control Type:	Signalized	Delay (sec / veh):	15.6
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.631

Intersection Setup

Name	N 4th Ave.			N 4th Ave.			N Adair St.			N Adair St.		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	1	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	49.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	Yes			Yes						Yes		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	N 4th Ave.			N 4th Ave.			N Adair St.			N Adair St.		
Base Volume Input [veh/h]	93	145	0	0	135	143	0	0	0	77	1529	97
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	0.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	3.00	2.00	0.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	12	0	0	0	0	0	8
Total Hourly Volume [veh/h]	93	145	0	0	135	131	0	0	0	77	1529	89
Peak Hour Factor	0.9500	0.9500	1.0000	1.0000	0.9500	0.9500	1.0000	1.0000	1.0000	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	24	38	0	0	36	34	0	0	0	20	402	23
Total Analysis Volume [veh/h]	98	153	0	0	142	138	0	0	0	81	1609	94
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			5			4			0		
v_di, Inbound Pedestrian Volume crossing m	0			4			5			0		
v_co, Outbound Pedestrian Volume crossing	1			3			1			3		
v_ci, Inbound Pedestrian Volume crossing mi	1			3			1			3		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	70.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	4	0	0	0	0	0	6	0
Auxiliary Signal Groups												
Maximum Green [s]	0	40	0	0	40	0	0	0	0	0	60	0
Amber [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	0.0	0.0	0.0	4.0	0.0
All red [s]	0.0	0.5	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.5	0.0
Walk [s]	0	7	0	0	7	0	0	0	0	0	8	0
Pedestrian Clearance [s]	0	13	0	0	16	0	0	0	0	0	15	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.5	0.0	0.0	2.5	0.0	0.0	0.0	0.0	0.0	2.5	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	30	0	0	30	0	0	0	0	0	60	0
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	0	0	0	10	0
Vehicle Extension [s]	0.0	2.5	0.0	0.0	2.5	0.0	0.0	0.0	0.0	0.0	6.1	0.0
Minimum Recall		No			No						Yes	
Maximum Recall		No			No						No	
Pedestrian Recall		No			No						No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	C		C	C
C, Cycle Length [s]	90	90	90	90		90	90
L, Total Lost Time per Cycle [s]	4.50	4.50	4.50	4.50		4.50	4.50
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00		0.00	0.00
l2, Clearance Lost Time [s]	2.50	2.50	2.50	2.50		2.50	2.50
g_i, Effective Green Time [s]	17	17	17	17		64	64
g / C, Green / Cycle	0.19	0.19	0.19	0.19		0.71	0.71
(v / s)_i Volume / Saturation Flow Rate	0.09	0.08	0.07	0.09		0.48	0.49
s, saturation flow rate [veh/h]	1091	1900	1900	1596		1862	1835
c, Capacity [veh/h]	206	360	360	302		1323	1304
d1, Uniform Delay [s]	38.66	32.15	31.91	32.40		7.26	7.33
k, delay calibration	0.08	0.08	0.08	0.08		0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00	1.00
d2, Incremental Delay [s]	1.26	0.59	0.51	0.82		2.79	2.91
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00	1.00

Lane Group Results

X, volume / capacity	0.48	0.42	0.39	0.46		0.68	0.68
d, Delay for Lane Group [s/veh]	39.91	32.74	32.42	33.22		10.04	10.24
Lane Group LOS	D	C	C	C		B	B
Critical Lane Group	Yes	No	No	No		No	Yes
50th-Percentile Queue Length [veh/ln]	2.14	2.95	2.68	2.74		7.69	7.76
50th-Percentile Queue Length [ft/ln]	53.60	73.86	67.01	68.48		192.34	193.95
95th-Percentile Queue Length [veh/ln]	3.86	5.32	4.82	4.93		12.24	12.33
95th-Percentile Queue Length [ft/ln]	96.49	132.94	120.62	123.26		306.06	308.15

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	39.91	32.74	0.00	0.00	32.43	33.22	0.00	0.00	0.00	10.04	10.14	10.24
Movement LOS	D	C			C	C				B	B	B
d_A, Approach Delay [s/veh]	35.54			32.82			0.00			10.14		
Approach LOS	D			C			A			B		
d_I, Intersection Delay [s/veh]	15.64											
Intersection LOS	B											
Intersection V/C	0.631											

Emissions

Vehicle Miles Traveled [mph]	5.27	8.23	4.92	4.92		39.40	39.24
Stops [stops/h]	85.76	118.17	107.22	109.56		307.75	310.32
Fuel consumption [US gal/h]	1.49	2.01	1.72	1.75		6.26	6.31
CO [g/h]	103.92	140.55	120.13	122.63		437.69	440.94
NOx [g/h]	20.22	27.35	23.37	23.86		85.16	85.79
VOC [g/h]	24.08	32.57	27.84	28.42		101.44	102.19

Other Modes

g_Walk,mi, Effective Walk Time [s]	12.0	12.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	7804.64	2298.74	1017.75	0.00
d_p, Pedestrian Delay [s]	33.80	33.80	34.67	34.67
l_p,int, Pedestrian LOS Score for Intersectio	2.245	2.280	2.759	2.728
Crosswalk LOS	B	B	C	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	567	567	0	1233
d_b, Bicycle Delay [s]	23.11	23.11	45.00	6.61
l_b,int, Bicycle LOS Score for Intersection	1.974	1.801	4.132	3.038
Bicycle LOS	A	A	D	C

Sequence

Ring 1	6	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: W Baseline Street and N/S 4th Avenue

Control Type:	Signalized	Delay (sec / veh):	12.2
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.520

Intersection Setup

Name	S 4th Ave.			N 4th Ave.			W Baseline St.			W Baseline St.		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	1	0	0	0	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	140.00	100.00	100.00	100.00	100.00	100.00	66.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	S 4th Ave.			N 4th Ave.			W Baseline St.			W Baseline St.		
Base Volume Input [veh/h]	0	78	54	102	111	0	160	1194	82	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	1.00	0.00	1.00	1.00	2.00	0.00	4.00	1.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	20	0	0	0	0	0	12	0	0	0
Total Hourly Volume [veh/h]	0	78	34	102	111	0	160	1194	70	0	0	0
Peak Hour Factor	1.0000	0.9500	0.9500	0.9500	0.9500	1.0000	0.9500	0.9500	0.9500	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	21	9	27	29	0	42	314	18	0	0	0
Total Analysis Volume [veh/h]	0	82	36	107	117	0	168	1257	74	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			4			4			0		
v_di, Inbound Pedestrian Volume crossing m	0			4			4			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	85.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	8	0	0	4	0	0	2	0	0	0	0
Auxiliary Signal Groups												
Maximum Green [s]	0	25	0	0	25	0	0	60	0	0	0	0
Amber [s]	0.0	4.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0	0.0	0.0	0.0
All red [s]	0.0	0.5	0.0	0.0	0.5	0.0	0.0	0.5	0.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	10	0	0	10	0	0	0	0
Pedestrian Clearance [s]	0	12	0	0	14	0	0	12	0	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.5	0.0	0.0	2.5	0.0	0.0	2.5	0.0	0.0	0.0	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	30	0	0	30	0	0	60	0	0	0	0
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	10	0	0	0	0
Vehicle Extension [s]	0.0	2.5	0.0	0.0	2.5	0.0	0.0	5.8	0.0	0.0	0.0	0.0
Minimum Recall		No			No			Yes				
Maximum Recall		No			No			No				
Pedestrian Recall		No			No			No				

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C	C	C	R	
C, Cycle Length [s]	90	90	90	90	90	90	90	
L, Total Lost Time per Cycle [s]	4.50	4.50	4.50	4.50	4.50	4.50	4.50	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.50	2.50	2.50	2.50	2.50	2.50	2.50	
g_i, Effective Green Time [s]	16	16	16	16	65	65	65	
g / C, Green / Cycle	0.18	0.18	0.18	0.18	0.72	0.72	0.72	
(v / s)_i Volume / Saturation Flow Rate	0.04	0.02	0.08	0.06	0.39	0.39	0.05	
s, saturation flow rate [veh/h]	1885	1615	1284	1885	1818	1840	1602	
c, Capacity [veh/h]	333	285	226	333	1315	1331	1159	
d1, Uniform Delay [s]	31.89	31.20	38.59	32.52	5.65	5.64	3.61	
k, delay calibration	0.08	0.08	0.08	0.08	0.50	0.50	0.50	
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.28	0.15	1.15	0.47	1.59	1.56	0.11	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	0.25	0.13	0.47	0.35	0.54	0.54	0.06	
d, Delay for Lane Group [s/veh]	32.17	31.34	39.73	32.99	7.24	7.20	3.72	
Lane Group LOS	C	C	D	C	A	A	A	
Critical Lane Group	No	No	Yes	No	Yes	No	No	
50th-Percentile Queue Length [veh/ln]	1.54	0.66	2.32	2.25	5.29	5.32	0.35	
50th-Percentile Queue Length [ft/ln]	38.55	16.57	58.02	56.23	132.30	132.93	8.71	
95th-Percentile Queue Length [veh/ln]	2.78	1.19	4.18	4.05	9.06	9.10	0.63	
95th-Percentile Queue Length [ft/ln]	69.39	29.82	104.43	101.21	226.62	227.47	15.67	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	32.17	31.34	39.73	32.99	0.00	7.24	7.22	3.72	0.00	0.00	0.00
Movement LOS		C	C	D	C		A	A	A			
d_A, Approach Delay [s/veh]	31.92			36.21			7.05			0.00		
Approach LOS	C			D			A			A		
d_I, Intersection Delay [s/veh]	12.19											
Intersection LOS	B											
Intersection V/C	0.520											

Emissions

Vehicle Miles Traveled [mph]	3.94	1.73	5.75	6.29	49.89	50.31	5.20	
Stops [stops/h]	61.68	26.51	92.83	89.96	211.68	212.68	13.93	
Fuel consumption [US gal/h]	1.04	0.45	1.61	1.54	4.27	4.29	0.35	
CO [g/h]	72.68	31.26	112.88	107.74	298.42	300.19	24.27	
NOx [g/h]	14.14	6.08	21.96	20.96	58.06	58.41	4.72	
VOC [g/h]	16.84	7.25	26.16	24.97	69.16	69.57	5.62	

Other Modes

g_Walk,mi, Effective Walk Time [s]	14.0	14.0	14.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	2052.35	0.00
d_p, Pedestrian Delay [s]	32.09	32.09	32.09	34.67
l_p,int, Pedestrian LOS Score for Intersectio	2.076	2.091	2.445	2.559
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	567	567	1233	0
d_b, Bicycle Delay [s]	23.11	23.11	6.61	45.00
l_b,int, Bicycle LOS Score for Intersection	1.787	1.929	2.806	4.132
Bicycle LOS	A	A	C	D

Sequence

Ring 1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 3: Site Access A

Control Type:	Two-way stop	Delay (sec / veh):	32.7
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.332

Intersection Setup

Name	Site Access A				N Adair St.	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name	Site Access A				N Adair St.	
Base Volume Input [veh/h]	61	0	0	0	88	1678
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	2.00	2.00	2.00	0.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	61	0	0	0	88	1678
Peak Hour Factor	0.9500	1.0000	1.0000	1.0000	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	16	0	0	0	23	442
Total Analysis Volume [veh/h]	64	0	0	0	93	1766
Pedestrian Volume [ped/h]	5		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.33	0.00	0.00	0.00	0.06	0.02
d_M, Delay for Movement [s/veh]	32.74	0.00	0.00	0.00	7.33	0.00
Movement LOS	D				A	A
95th-Percentile Queue Length [veh/ln]	1.38	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	34.40	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	32.74		0.00		0.37	
Approach LOS	D		A		A	
d_I, Intersection Delay [s/veh]	1.44					
Intersection LOS	D					

Intersection Level Of Service Report
Intersection 4: Site Access B

Control Type:	Two-way stop	Delay (sec / veh):	21.3
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.234

Intersection Setup

Name	Site Access		W Baseline St.		W Baseline St.	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name	Site Access		W Baseline St.		W Baseline St.	
Base Volume Input [veh/h]	64	0	55	1372	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	2.00	0.00	4.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	64	0	55	1372	0	0
Peak Hour Factor	0.9500	1.0000	0.9500	0.9500	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	17	0	14	361	0	0
Total Analysis Volume [veh/h]	67	0	58	1444	0	0
Pedestrian Volume [ped/h]	5		0		0	

Intersection Settings

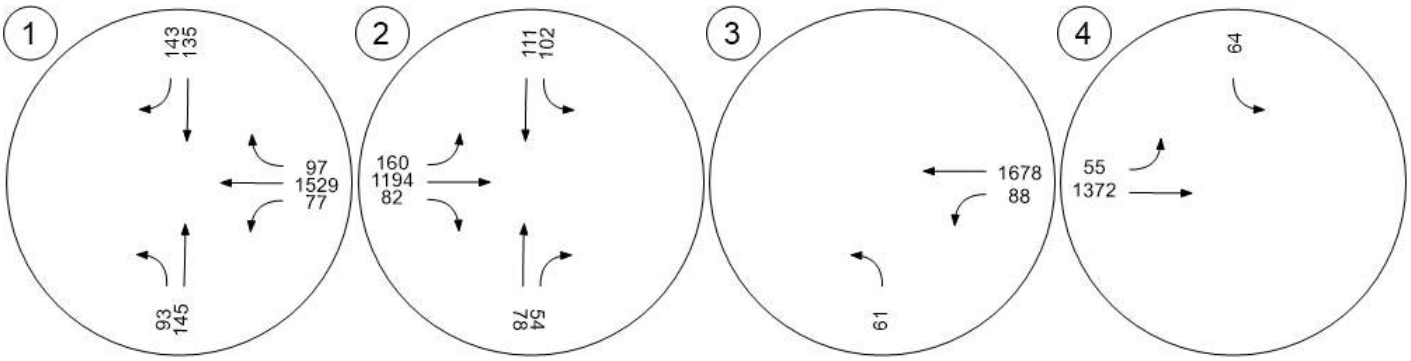
Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.23	0.00	0.04	0.01	0.00	0.00
d_M, Delay for Movement [s/veh]	21.33	0.00	7.29	0.00	0.00	0.00
Movement LOS	C		A	A		
95th-Percentile Queue Length [veh/ln]	0.89	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	22.14	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	21.33		0.28		0.00	
Approach LOS	C		A		A	
d_I, Intersection Delay [s/veh]	1.18					
Intersection LOS	C					

Traffic Volume - Base Volume

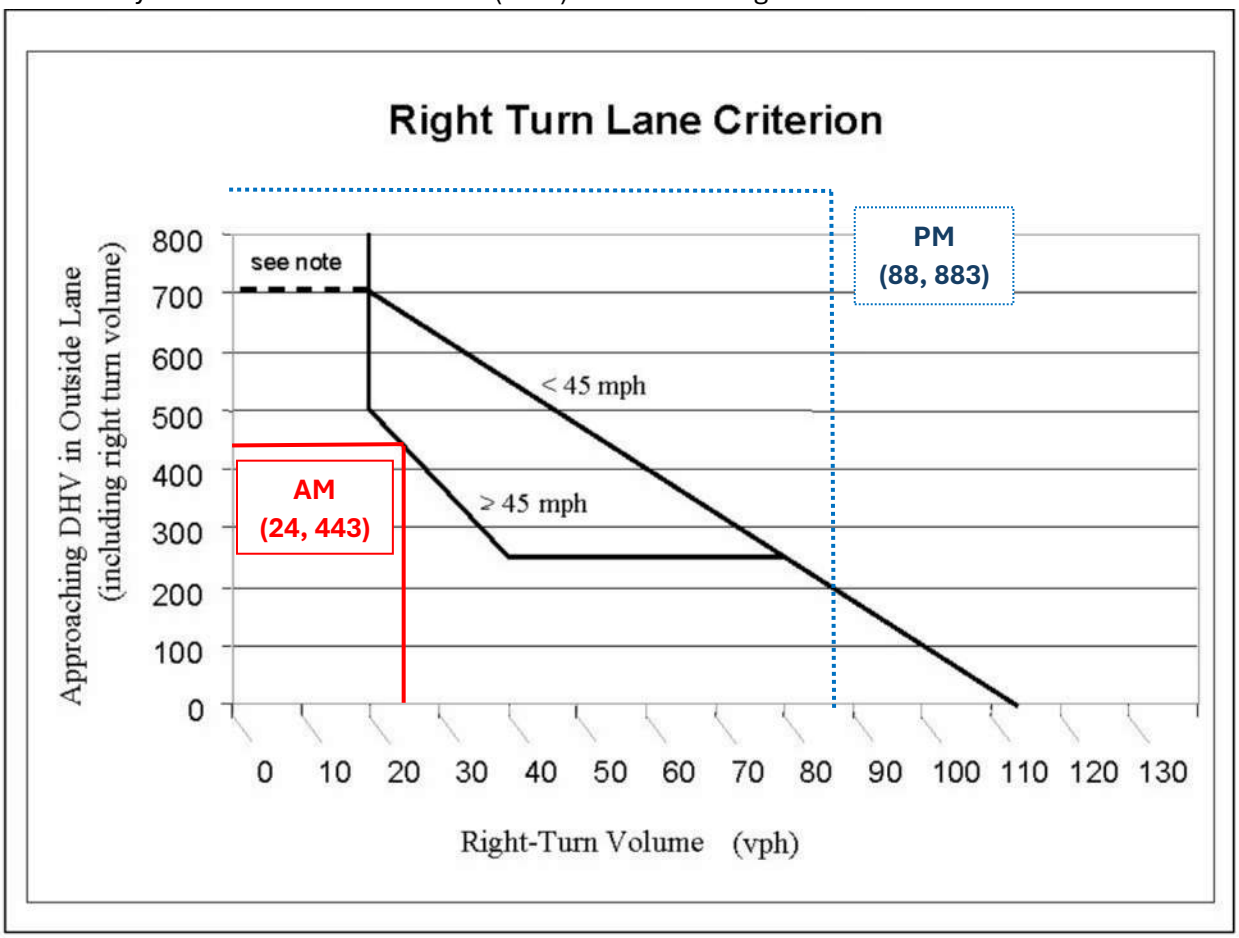




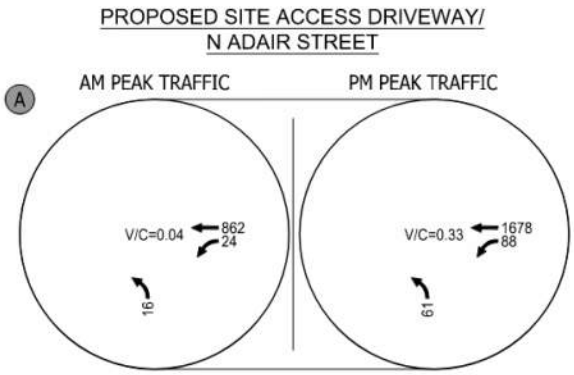
Appendix H:
Turn Lane Criteria Evaluation

Site Access A – N Adair Street

ODOT Analysis and Procedures Manual (APM) Exhibit 12-2 Right Turn Lane Criterion



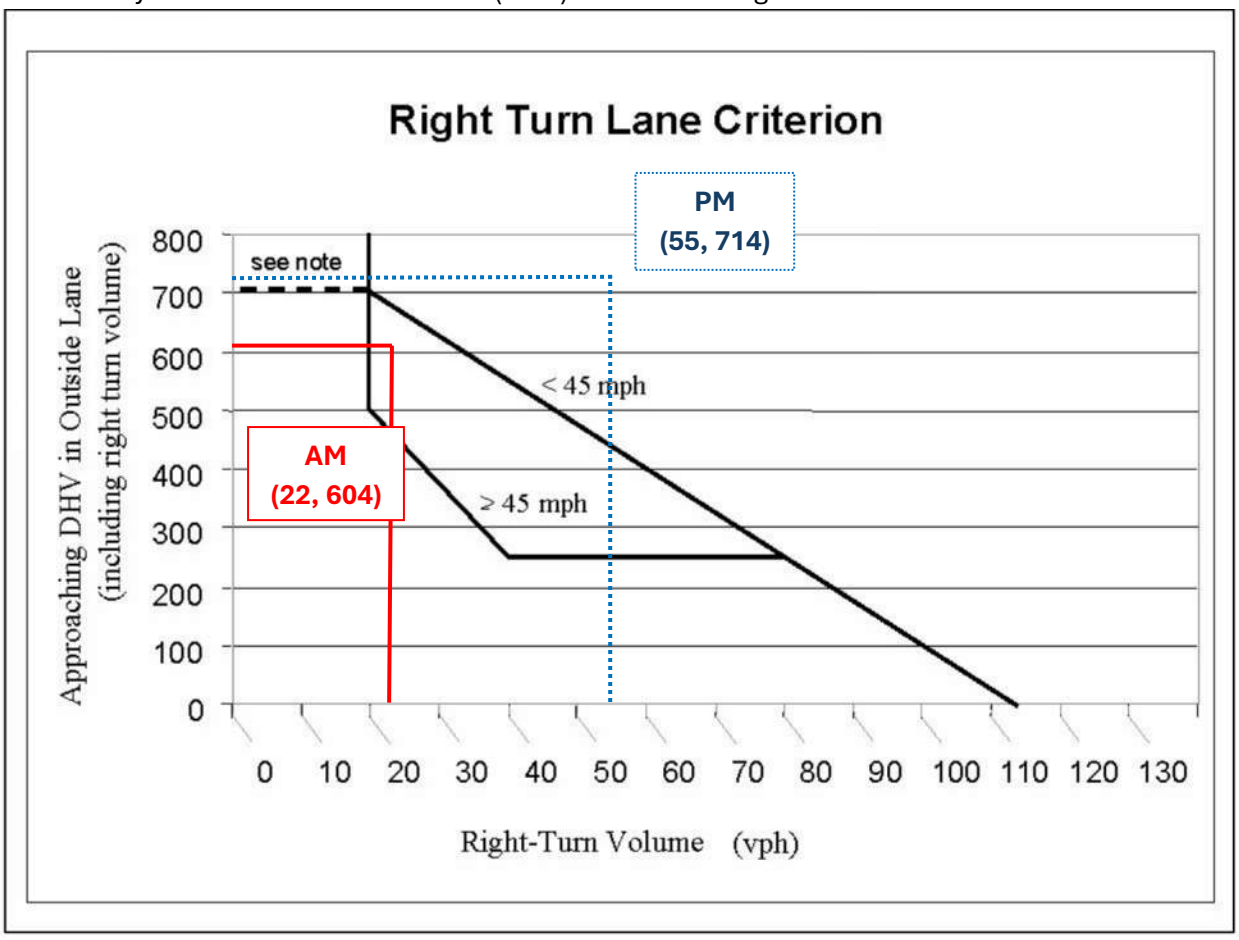




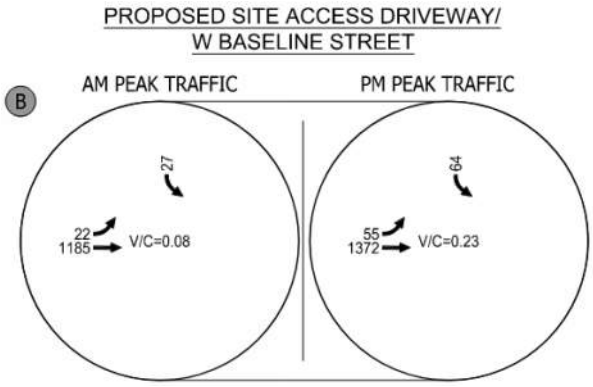
Speed limit 40mph

Site Access B – W Baseline Street

ODOT Analysis and Procedures Manual (APM) Exhibit 12-2 Right Turn Lane Criterion







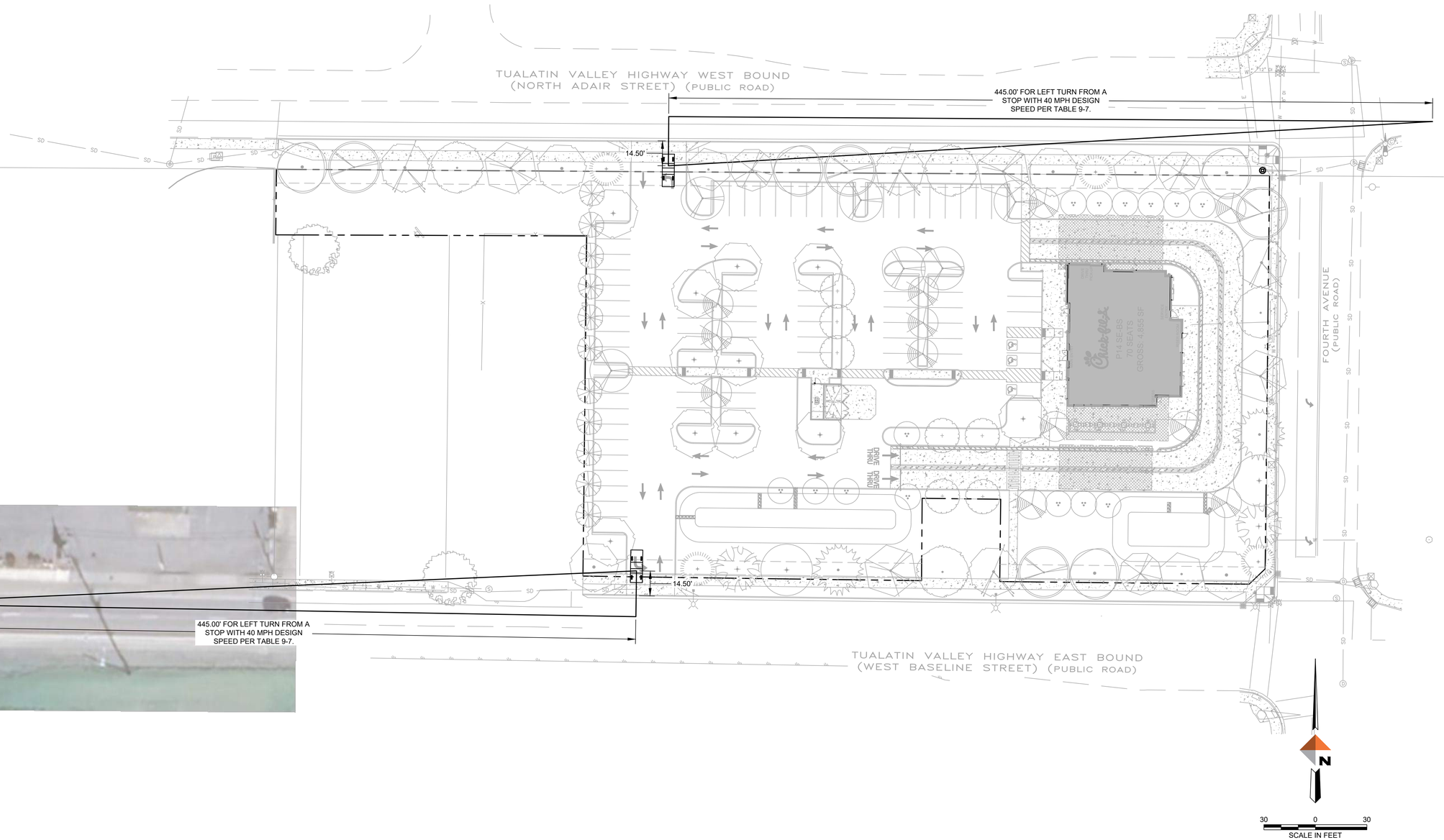
Speed limit 40mph

Appendix I:
Driveway Sight Distance Exhibit

LEGEND

PARKING STRIPES	PROPOSED CONCRETE
ROAD STRIPING	
EXISTING FLOW LINE CURB	
EXISTING TOP OF CURB	
EDGE OF PAVEMENT	PROPOSED LANDSCAPING
EDGE OF CONCRETE	
PROPOSED STANDARD CURB	
WATER	PROPOSED ASPHALT RESTORATION
STORM SEWER	
GAS	SIGN
ELECTRIC	TREE - DECIDUOUS
SANITARY SEWER	PUBLIC SIGNAL
CENTERLINE	STORM CATCH BASIN
RIGHT OF WAY BOUNDARY LINE	FIRE HYDRANT
PROPOSED PROPERTY LINE	
EASEMENT	PROPOSED TREES
LOT/PARCEL LINE	
SAW CUT LINE	





Chick-fil-A
5200 Buffington Road
Atlanta, Georgia
30349-2998

DOWL
309 SW 6TH AVENUE, #700
Portland, Oregon 97204
971-280-8641

CHICK-FIL-A
HWY 8 & 4TH AVE
CORNELIUS, OREGON

FSR# 05889

REVISION SCHEDULE

NO.	DATE	DESCRIPTION

CIVIL'S PROJECT # 16076.01
PRINTED FOR SCHEMATIC DESIGN
DATE JUNE 2024
DRAWN BY CJG

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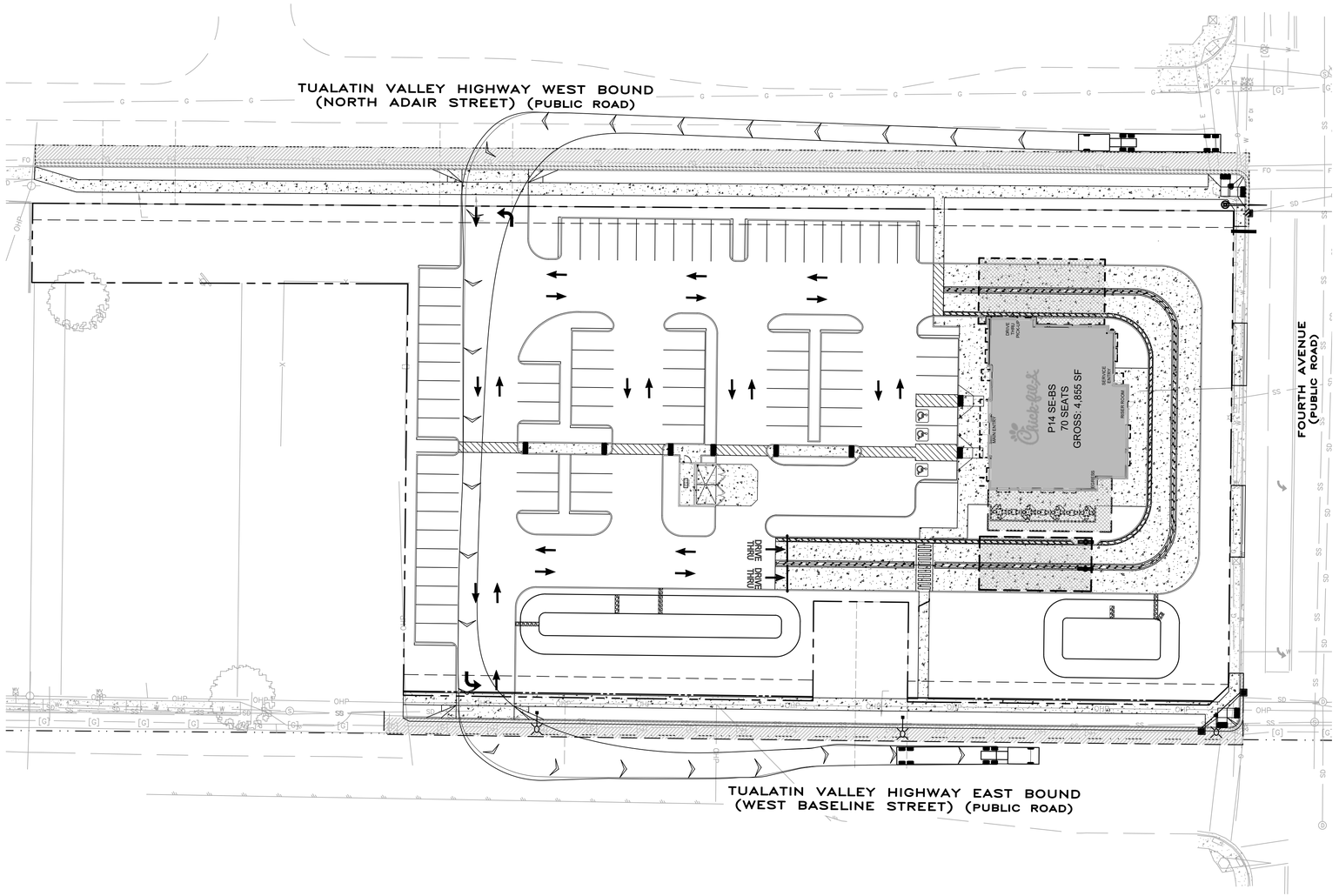
SHEET
SIGHT DISTANCE

SHEET NUMBER
1 OF 1

DESIGN REVIEW

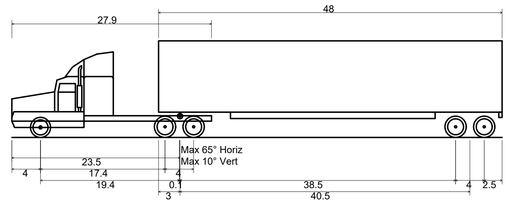
C:\dowl_pwd\041747\sight distance.dwg PLOT DATE 2024-9-24 15:54 SAVED DATE 2024-09-24 15:54 USER: russell

Appendix J:
Delivery Truck Circulation Exhibit



LEGEND

- PARKING STRIPES
- ROAD STRIPING
- EXISTING FLOW LINE CURB
- EXISTING TOP OF CURB
- EDGE OF PAVEMENT
- EDGE OF CONCRETE
- PROPOSED STANDARD CURB
- W — WATER
- SD — STORM SEWER
- G — GAS
- E — ELECTRIC
- SS — SANITARY SEWER
- CENTERLINE
- RIGHT OF WAY BOUNDARY LINE
- PROPOSED PROPERTY LINE
- EASEMENT
- LOT/PARCEL LINE
- SAW CUT LINE
- PROPOSED CONCRETE
- PROPOSED LANDSCAPING
- PROPOSED ASPHALT RESTORATION
- SIGN
- TREE - DECIDUOUS
- PUBLIC SIGNAL
- STORM CATCH BASIN
- FIRE HYDRANT



Copy of WB-62 - CFA

Overall Length	68.500ft
Overall Width	8.500ft
Overall Body Height	13.500ft
Min Body Ground Clearance	1.393ft
Max Track Width	8.500ft
Lock-to-lock time	6.00s
Max Steering Angle (Virtual)	28.40°

DELIVERIES TO BE MADE
DURING NON-BUSINESS HOURS



Chick-fil-A
5200 Buffington Road
Atlanta, Georgia
30349-2998

DOWL
309 SW 6TH AVENUE, #700
Portland, Oregon 97204
971-280-8641

CHICK-FIL-A
HWY 8 & 4TH AVE
CORNELIUS, OREGON

FSR# 05889

REVISION SCHEDULE

NO.	DATE	DESCRIPTION

CIVIL'S PROJECT # 16076.01
PRINTED FOR SCHEMATIC DESIGN
DATE JUNE 2024
DRAWN BY CJG

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SHEET
TRUCK TURNING

SHEET NUMBER
1 OF 1

DESIGN REVIEW

C:\dowl_pw\d0417500\truck.dwg PLOT DATE 2024-09-24 13:50 SAVED DATE 2024-09-24 13:50 USER: russell

Neighborhood Meeting Notice

Neighborhood Review Meeting

on a

Preliminary Development Proposal affecting

47 N 4th St. Cornelius, OR 97113

Proposed as

A New Chick-fil-A location

A meeting to discuss the preliminary development proposal is scheduled for

12:00PM on 8/29/2024 in the Walters Gallery at the Cornelius Public Library located at 1370 N Adair St, Cornelius, OR 97113

All interested persons may attend

For more information, please contact

Austin Cross at across@4gdev.com

DEVELOPER OR AGENT: 46 Development and Consulting

PROJECT LOCATION: 47 N 4th St Cornelius, OR

AFFIDAVIT OF MAILING NOTICE

I, Austin Cross, being first duly sworn; say that I am (represent) the party intended to submit an application to the City of Cornelius for a proposed Chick-fil-A affecting land located at 47 N 4th Ave, and that pursuant to Ordinance 810, Chapter 18.10, and the guidelines set out by the Community Development Director, did on the 7th day of August, 2024, personally mail notice to affected property owners within 250 feet of the proposed development site.

Sign and Date in the presence of a Notary Public. Certain City staff are Notary Publics and are available for witnessing.

Signature: [signature]

Dated this 9th day of September, 2024

State of Oregon
County of _____

Subscribed and sworn to (or affirmed) before me this ____ day of _____, _____.

See Attached For Notary Public

Notary Public for the State of Oregon

My Commission expires: _____

JURAT WITH AFFIANT STATEMENT

☒ See Attached Document (Notary to cross out lines 1–6 below)
☐ See Statement Below (Lines 1–5 to be completed only by document signer[s], *not* Notary)

1 _____
2 _____
3 _____
4 _____
5 _____
6 _____

Signature of Document Signer No. 1

Signature of Document Signer No. 2 (if any)

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California

County of El Dorado

Subscribed and sworn to (or affirmed) before me on this 9 day of SEPT, 2024, by

(1) AUSTIN CROSS,
Name of Signer

proved to me on the basis of satisfactory evidence to be the person who appeared before me (.) (,)

(and

(2) _____,
Name of Signer

proved to me on the basis of satisfactory evidence to be the person who appeared before me.)

Signature _____
Signature of Notary Public

J. R. HENDERSON
COMM. #2337543
Notary Public · California
El Dorado County
Comm. Expires Nov. 16, 2024

Place Notary Seal Above

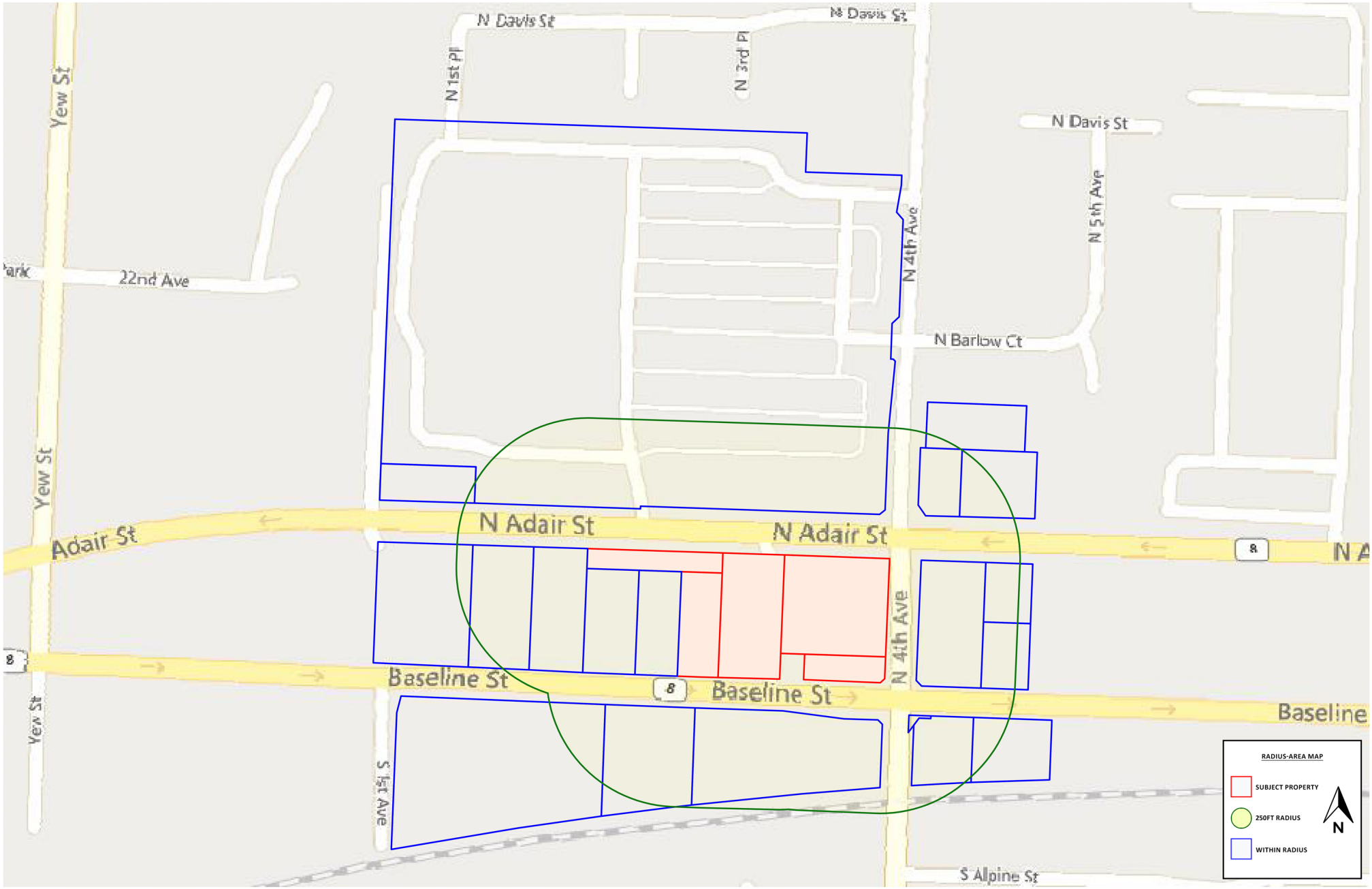
OPTIONAL

Though the information below is not required by law, it may prove valuable to persons relying on the document and could prevent fraudulent removal and reattachment of this form to another document.

Further Description of Any Attached Document

Title or Type of Document: ACKNOWLEDGMENT

Document Date: 9-9-2024 Number of Pages: 1


N Davis St
N Davis St
N 1st Pl
N 3rd Pl
N Davis St
Yew St
N 4th Ave
N 5th Ave
22nd Ave
N Barlow Ct
Yew St
N Adair St
N Adair St
Adair St
8
N A
8
N 4th Ave
Baseline St
8
Baseline St
Baseline
Yew St
S 1st Ave
S Alpine St
RADIUS-AREA MAP
SUBJECT PROPERTY
250FT RADIUS
WITHIN RADIUS
N

OWNER LIST - 250FT

(DUPLICATE OWNERS COMBINED)

TAX LOT ID	PROPERTY ID	OWNER NAME	MAILING ADDRESS	CITY STATE ZIP
1N333CC02400 (ET AL)	R751859	HBH EQUITY LLC	5420 NW SEWELL RD	HILLSBORO, OR 97124
1N333CC02800	R751895	AJS ENTERPRISES LLC	17104 SW GREEN HERON DR	SHERWOOD, OR 97140
1N333CC02900	R751902	KUNTZ ENTERPRISES LLC	PO BOX 329	CORNELIUS, OR 97113
1N333CC03100 & 1N333CC03200	R751939	F DAVIS PROPERTIES LLC	6950 NW KANSAS CITY RD	FOREST GROVE, OR 97116
1N333CC03400	R751966	KB LAND DEVELOPMENT CO LLC	875 COUNTRY CLUB DR	EUGENE, OR 97401
1N333CC03500	R751975	SHIPMAN LIVING TRUST	PO BOX 1588	ROCKAWAY BEACH, OR 97136
1N333CC13900	R2162828	WAL-MART STORES INC	PO BOX 8050 MS 0555	BENTONVILLE, AR 72716
1N333CD03100	R751449	EMMERT, TERRY W	11811 SE HWY #212	CLACKAMAS, OR 97015
1N333CD03200 (ET AL)	R751485	WHEELER, JOHN FORREST SURVIVOR'S TRUST	12705 SE RIVER RD APT 305C	PORTLAND, OR 97222
1N333CD03600	R751494	442 WEST BASELINE LLC	3200 PARK CENTER DR STE 1240	COSTA MESA, CA 92626
1S304BA00500	R409427	AYRES, MARVIN V ESTATE OF	PO BOX 153	CORNELIUS, OR 97113
1S304BA00600	R409436	SCHOEN, MICHAEL J & SCHOEN, PAMELA A	PO BOX 153	CORNELIUS, OR 97113
1S304BA00601	R2098253	CORNELIUS, CITY OF	1355 N BARLOW ST	CORNELIUS, OR 97113
1S304BB00100 & 1S304BB00200	R409944	KEM DEVELOPMENT INC	20449 SW TUALATIN VALLEY HWY #325	BEAVERTON, OR 97003
1S304BB00300	R409962	TILDEN, RICHARD H REV TRUST & TILDEN, ANN SNYDER REV TRUST	PO BOX 25404	PORTLAND, OR 97298

Meeting Notes

Attendees - HBH Equity LLC

Agenda and Comments: A site plan was presented and questions about the development were answered.

Oregon
Tina Kotek, Governor

Department of Transportation
Transportation Region 1
123 NW Flanders St.
Portland, OR 97209-4012
(503) 731-8200
Fax: (503) 731-8259

10/2/24 ODOT # 13238

ODOT Formal Response

Project Name: Chick-fil-A	**Applicant:** Austin Cross
Jurisdiction: City of Cornelius	**Jurisdiction Case #:**
Site Address: W Baseline St and N 4th Ave	**State Highway:** Baseline St and Adair St (OR 8)

The site of this proposed land use action is adjacent to Baseline St and Adair St (OR 8). ODOT has permitting authority for this facility and an interest in ensuring that this proposed land use is compatible with its safe and efficient operation.

All ODOT permits and approvals must reach 100% plans before the District Contact signs off on a local jurisdiction building permit or other necessary requirement before construction. T**he applicant should contact the District Contact indicated below to determine permit requirements and to obtain application information**.

These comments, standards, and requirements are current as of the date of this letter. If the project scope and/or timeline has been modified, the applicant should contact the ODOT Region 1 Development Review program (ODOT_R1_DevRev@odot.oregon.gov) for an updated letter as updated comments may be necessary.

LAND USE PROPOSAL

The proposed approximately 4,855 square foot Chick-fil-A will replace three existing homes between N Adair Street and W Baseline Street west of N 4th Avenue. The proposed Chick-fil-A will have two drive through lanes located along the east side of the building and will have 70 seats available for dine-in customers. The site is proposed to have one left in/left out access on N Adair Street and one left in/left out access on W Baseline Street. Restaurant development and occupancy is anticipated in 2026.

COMMENTS/FINDINGS

Traffic Impacts

ODOT has review the Traffic impact analysis and concurs with the conclusion that no off site capacity mitigation measures are needed to satisfy ODOT's mobility targets. No further analysis is needed.

State Highway Frontage Improvements

ODOT supports the city engineer required frontage improvements along both highway frontages including:

- Concrete curb and gutter
- 6-foot parkway strip with street trees (Street trees will be permitted by ODOT when located in a planter strip between the curb and sidewalk where the posted speed is 35MPH or less and a

Design Exception is obtained for the ODOT clear zone requirements. Trees will be permitted behind the sidewalk with a clear zone Design Exception.)
- 6-foot concrete sidewalk
- Cobra-head street lights on their own poles
- Undergrounding all overhead lines
- Right of way donation to ODOT as necessary to implement the city's adopted cross section for the highway frontage improvements.

Proposed Landscaping on ODOT Right of Way
The applicant is proposing to landscape the ODOT property adjacent to the development. An ODOT Miscellaneous Permit is required to landscape this property and the applicant will be required to maintain the landscaping.

ODOT Permit Requirements

- An ODOT permit is required to connect to the ODOT drainage system.
- An ODOT Miscellaneous Permits is required by ODOT for all work in the State highway right of way.

Vehicular Access to the State Highway

Based on a review of the provided documents, the proposed development reaches the "Change of Use" of the OR-8 accesses (Baseline Street and Adair Street) as discussed in Oregon Administrative Rule (OAR) 734-051-3020(2). Applications for State Highway Approach for each proposed access are required.

Based on the updated site plan provided in the Traffic Impact Analysis, two Applications for State Highway Approach are required as well as an Application for Indenture of Access for the access along Adair Street.

ODOT Technical Review Requirements

All alterations within the State highway right of way are subject to ODOT standards. Alterations along the State highway but outside of the ODOT right of way may also be subject to ODOT review pending its potential impact on the safe operation of the State highway.

The following ODOT manuals may apply:

- ODOT Traffic Manual
- ODOT Highway Design Manual
- ODOT Hydraulics Design Manual

The ODOT Traffic Manual (TM) identifies items that require ODOT Region Traffic Engineer (RTE) approval. Items requiring RTE approval must be prepared by an Oregon-registered Professional Engineer (P.E.) and will be reviewed by the ODOT Region 1 Technical Center. See the TM for information on authorities and required approvals. Some approvals require a unique request form (Traffic Approval).

Deviations from ODOT Standards

Proposed alterations that deviate from ODOT standards will require a Design Exception/Deviation prepared by an Oregon-registered Professional Engineer (P.E.) for review by the ODOT Region 1

Technical Center. ODOT can only determine if design elements will require a Design Exception/Deviation or RTE approval once detailed plans have been reviewed.

Note: A Design Exception/Deviation or RTE approval items may take **6 months or longer to process**. The preparation of a Design Exception or RTE approval does not guarantee its ultimate approval.

ODOT RECOMMENDED CONDITIONS OF APPROVAL FOR LOCAL JURISDICTION

State Highway Frontage Improvements

☒ Curb, planter, sidewalk, curb ramps, and bike lanes shall be constructed as necessary to implement the jurisdiction's planned cross section along the State highway consistent with ODOT Highway Design Manual, ODOT Traffic Manual, and Americans with Disabilities Act (ADA) standards.

Note: Ownership of public frontage improvements constructed by the development shall be consistent with jurisdictional boundaries.

☒ Right of way shall be donated to ODOT as necessary to accommodate the planned cross section on the ODOT owned facility. The donation deed must be to the State of Oregon - Oregon Department of Transportation and shall be recorded with the County. The property owner must be the signatory for the deed and will be responsible for a certified environmental assessment of the site before the property is transferred to ODOT. The ODOT District Contact will assist in coordinating the transfer. ODOT should verify with the local jurisdiction that this requirement has been fulfilled prior to final permitting.

Note: All public frontage improvements on State owned facilities must be within State owned right of way. Donation of additional property to ODOT may be necessary to construct required improvements.

Note: It may take **6 months or longer** to transfer property ownership to ODOT.

Vehicular Access to the State Highway

☒ An ODOT State Highway Approach Road Permit is required for State highway access with approval of an Application for State Highway Approach. With application submittal, design vehicle turning templates may need to be provided. Site access to the State highway is regulated by OAR 734-051. For application information go to:

https://www.oregon.gov/odot/engineering/pages/access-management.aspx.

Note: It may take up to **6 months or longer** to process an Application for State Highway Approach depending on the level of project complexity and plan review necessary. A general review timeline for Application for State Highway Approach is shown in the link below:

https://www.oregon.gov/odot/Engineering/Docs_AccessMngt/TimeLine.pdf

Vehicular Access Control

☒ The applicant is advised that the subject property's access rights are owned by ODOT along the State highway frontage. During acquisition, the subject property was granted a Reservation of Access, as recorded in the property deed. Based on the reviewed material and/or discussions with the applicant, the proposal is altering the Reservation, and an Application for Indenture of Access submittal is required. If ODOT approves the Indenture, the Reservation modifications must be recorded in the property deed. The property owner is responsible for the $200 processing fee for an Indenture of Access and recording the deed.

Note: It may take **6 months or longer** to process an Indenture of Access.

Permits and Agreements to Work in State Highway

☒ An ODOT Miscellaneous Permit must be obtained for all work in the State highway. When the total value of improvements within the State highway is estimated to be $100,000 or more, a Cooperative Improvement Agreement (CIA) with ODOT is required. A CIA will address the transfer of the improvements to ODOT and any associated technical and administrative costs for projects that meet this improvement threshold. Agreements shall address the work standards that must be followed, maintenance responsibilities, and compliance with ORS 276.071, which includes State of Oregon prevailing wage requirements.

Note: If a CIA is required, it may take **6 months or longer** to process.

☒ An ODOT Miscellaneous Permit must be obtained for landscaping on ODOT property. The applicant shall maintain the landscaping.

☒ The applicant must obtain an ODOT Miscellaneous Permit to place trees in the State right of way. Tree placement must be consistent with the ODOT Highway Design Manual section 406.1.

If the proposed tree placement does not meet ODOT Highway Design Manual criteria, a Design Exception must be prepared by an Oregon-registered Professional Engineer (P.E.) for review by the Region 1 Technical Center. The preparation of a Design Exception request does not guarantee its ultimate approval.

Note: It may take **6 months or longer** to process a Design Exception.

☒ Illumination within the State right of way must be consistent with AASHTO illumination standards, ODOT Traffic Lighting Design Manual, and the ODOT Lighting Policy and Guidelines, which states that local jurisdictions must enter into an Intergovernmental Agreement (IGA) with ODOT wherein the local jurisdiction is responsible for installation, maintenance, operation, and energy costs. ODOT Region Traffic Engineer (RTE) approval will be required and is how the design will be documented to meet the above stated standards.

Note: It may take **6 months or longer** to process a RTE approval.

☒ An ODOT Miscellaneous Permit is required for new or modified connections to State highway drainage facilities. Connections will only be considered if the site's drainage naturally enters the State highway drainage facility. The applicant must provide ODOT District with a preliminary drainage plan showing impacts to the State highway drainage facility.

A drainage study prepared by an Oregon-registered Professional Engineer (P.E.) is usually required by ODOT if:

1. Modification to site development or State highway facility trigger the need for treatment, detention and drainage modifications per both local and state standards; or
2. Total peak runoff entering the State highway drainage facility is more significant than 1.77 cubic feet per second; or
3. The improvements increase the impervious surface area to greater than 10,758 square feet.

Contact the ODOT Development Review Planner identified below for further coordination or questions regarding ODOT comments and requirements during the land use process.

Please send a copy of the Land Use Notice to: ODOT_R1_DevRev@odot.oregon.gov.

Development Review Planner: Marah Danielson	Marah.b.danielson@odot.oregon.gov
Traffic Contact: John Russell, P.E.	John.Russell@odot.oregon.gov
District Contact: District 2B	D2bup@odot.oregon.gov

Clean Water Services

SENSITIVE AREA PRE-SCREENING SITE ASSESSMENT

Clean Water Services File Number 24-001949

1. **Jurisdiction:** Washington County

2. **Property Information** (example: 1S234AB01400)
   Tax lot ID(s): 1N333CC02400, 1N333CC02500, 1N333CC0260

   ***OR* Site Address:** 47 N 4th Ave
   City, State, Zip: Cornelius,OR,97113
   Nearest cross street:

3. **Owner Information**
   Name: Kase Abusharkh
   Company: Bear Equities
   Address: 3303 Lee Pkwy
   City, State, Zip: Dallas,Texas,75219
   Phone/fax: 9253481844
   Email: kase@bearequities.com

4. **Development Activity** (check **all** that apply)
   - ☐ Addition to single family residence (rooms, deck, garage)
   - ☐ Lot line adjustment
   - ☐ Minor land partition
   - ☐ Residential condominium
   - ☐ Commercial condominium
   - ☐ Residential subdivision
   - ☐ Commercial subdivision
   - ☐ Single lot commercial
   - ☐ Multi lot commercial
   - Other: Commercial Restaurant

4. **Applicant Information**
   Name: Austin Cross
   Company: 4G Land Development and Consulting, Inc.
   Address: PO Box 270571
   City, State, Zip: San Diego,CALIFORNIA,92198
   Phone/fax: 9168177587
   Email: across@4gdev.com

6. **Will the project involve any off-site work?** ☒ Yes ☐ No ☐ Unknown
   Location and description of off-site work: Replacing water main along Adair.

7. **Additional comments or information that may be needed to understand your project:**

This application does NOT replace Grading and Erosion Control Permits, Connection Permits, Building Permits, Site Development Permits, DEQ 1200-C Permit or other permits as issued by the Department of Environmental Quality, Department of State Lands and/or Department of the Army COE. All required permits and approvals must be obtained and completed under applicable local, state, and federal law.

By signing this form, the Owner or Owner's authorized agent or representative, acknowledges and agrees that employees of Clean Water Services have authority to enter the project site at all reasonable times for the purpose of inspecting project site conditions and gathering information related to the project site. I certify that I am familiar with the information contained in this document, and to the best of my knowledge and belief, this information is true, complete, and accurate.

Print/type name: Austin Cross Print/type title: Project Engineer

Signature: ONLINE SUBMITTAL Date: 8/28/2024

FOR DISTRICT USE ONLY

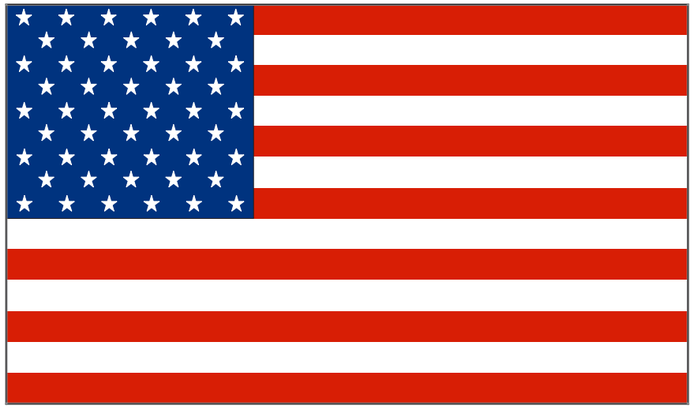
- ☐ Sensitive areas potentially exist on site or within 200' of the site. **THE APPLICANT MUST PERFORM A SITE ASSESSMENT PRIOR TO ISSUANCE OF A SERVICE PROVIDER LETTER.** If Sensitive Areas exist on the site or within 200 feet on adjacent properties, a Natural Resources Assessment Report may also be required.
- ■ Based on review of the submitted materials and best available information sensitive areas do not appear to exist on site or within 200' of the site. This Sensitive Area Pre-Screening Site Assessment does NOT eliminate the need to evaluate and protect water quality sensitive areas if they are subsequently discovered. This document will serve as your Service Provider Letter as required by Resolution and Order 19-5, Section 3.02.1, as amended by Resolution and Order 19-22. All required permits and approvals must be obtained and completed under applicable local, State and federal law.
- ☐ Based on review of the submitted materials and best available information the above referenced project will not significantly impact the existing or potentially sensitive area(s) found near the site. This Sensitive Area Pre-Screening Site Assessment does NOT eliminate the need to evaluate and protect additional water quality sensitive areas if they are subsequently discovered. This document will serve as your Service Provider Letter as required by Resolution and Order 19-5, Section 3.02.1, as amended by Resolution and Order 19-22. All required permits and approvals must be obtained and completed under applicable local, state and federal law.
- ☐ **THIS SERVICE PROVIDER LETTER IS NOT VALID UNLESS _____ CWS APPROVED SITE PLAN(S) ARE ATTACHED.**
- ☐ The proposed activity does not meet the definition of development or the lot was platted after 9/9/95 ORS 92.040(2). **NO SITE ASSESSMENT OR SERVICE PROVIDER LETTER IS REQUIRED.**

Reviewed by: Jessica Chaplen Date: 8/29/2024

Once complete, email to: **SPLReview@cleanwaterservices.org** • Fax: **(503) 681-4439**
OR mail to: SPL Review, Clean Water Services, 2550 SW Hillsboro Highway, Hillsboro, Oregon 97123

Revised 2/2020

FOOTINGS BY OTHERS, FINAL SETTING BY NSMC



Flag

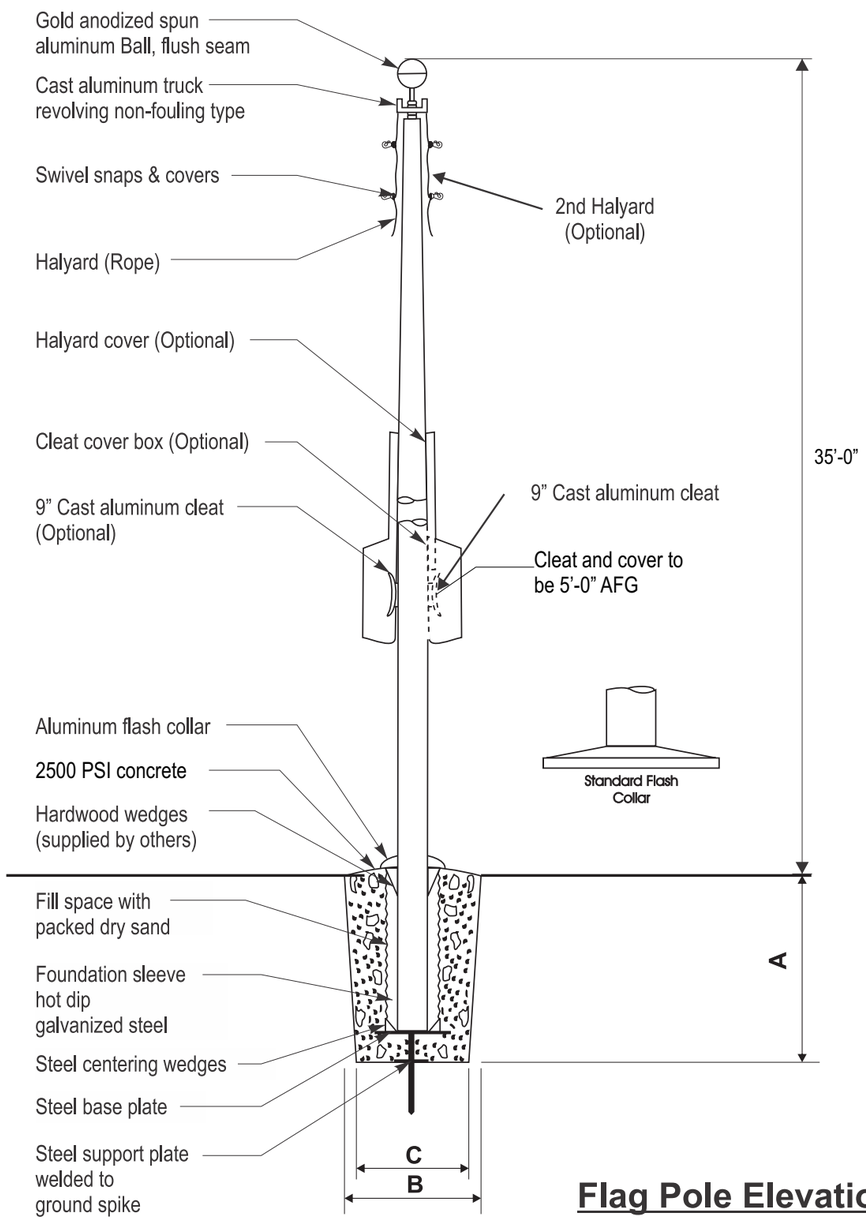
FOUNDATION SIZES

HEIGHT	A	B	C	FLAG SIZE
20'	3'-6"	30"	24"	6'-10'
25'	3'-6"	30"	24"	6'-10'
30'	3'-6"	30"	24"	6'-10'
35'	4'-0"	36"	30"	6'-10'
40'	4'-6"	42"	36"	12'-18'
45'	5'-0"	48"	42"	12'-18'
50'	5'-6"	48"	42"	12'-18'

Size Chart

Ground sleeve and concrete installed by the general contractor

Pole installed on pre-installed ground sleeve by sign contractor



Flag Pole Elevation

1 FLAG POLE

CFA-00108 - CFA FPL EC35 FLAG POLE COMPLETE W/ FLAG POLE KIT & GROUND SLEEVE

National Sign
& MARKETING CORPORATION
13580 5th St., Chino, CA 91710
Tel 909.591.4742 Fax 909.747.6446
e-mail: sales@nsmc.com
Lic# 745030 - Exp. 01/31/24

Project Name:

Chick-fil-A
5552 Lake Oswego In Line

Address:

14801 Kruse Oaks Dr.,
Lake Oswego, OR 97035

Account Mgr.

Steve Rosenbloom

Approved by:

Date:

Drawing Number

30295R8

Revision

09/29/23 MK: Added sign w/ backer to east elev., added LED page to signs and monument, added monument w/ brick, reduced pedestrian sign height
10/10/23 RL: Update site plan & elevations. Add R
10/18/23 MK: Updated elevations and "P"
11/09/23 MK: Updated site plan, added flag pole
5. 06/03/24 MK: Update site plan & elev., update finish on monument, relocate address
6. 06/24/24 MK: added two options for monument
7. 07/02/24 MK: Updated site plan, removed option 2 for O, added H
8. 09/09/24 MK: Updated monument to be 32 sq ft & 2 circuits

Designer: S. Duffy **Date:** 07/28/2023

FLAG POLE

Scale: NTS

Page 20

THIS IS AN ORIGINAL UNPUBLISHED DRAWING CREATED FOR YOUR PERSONAL USE IN CONNECTION WITH A PROJECT PLANNED FOR YOU BY NSMC. IT IS NOT TO BE SHOWN OUTSIDE YOUR ORGANIZATION NOR USED, REPRODUCED, COPIED OR EXHIBITED IN ANY FASHION UNLESS AUTHORIZED IN WRITING BY AN OFFICER OF NSMC

This sign intended to be in accordance with the requirements of Article 600 of the National Electrical Code and/or other applicable local codes. This includes proper grounding and bonding of this sign.

VISEO ELECTRONIC SIGNS

BIKE RACK

Manufacturer:

Belson Outdoors

Contact Information:

Belson Outdoors
800-323-5664
sales@belson.com

Standard Description:

Orion In-ground or surface mount steel bike rack

Dimensions: 40”L x 33”H x 2-3/8” round tube

Finish: Black Powder Coated

Product Used In:

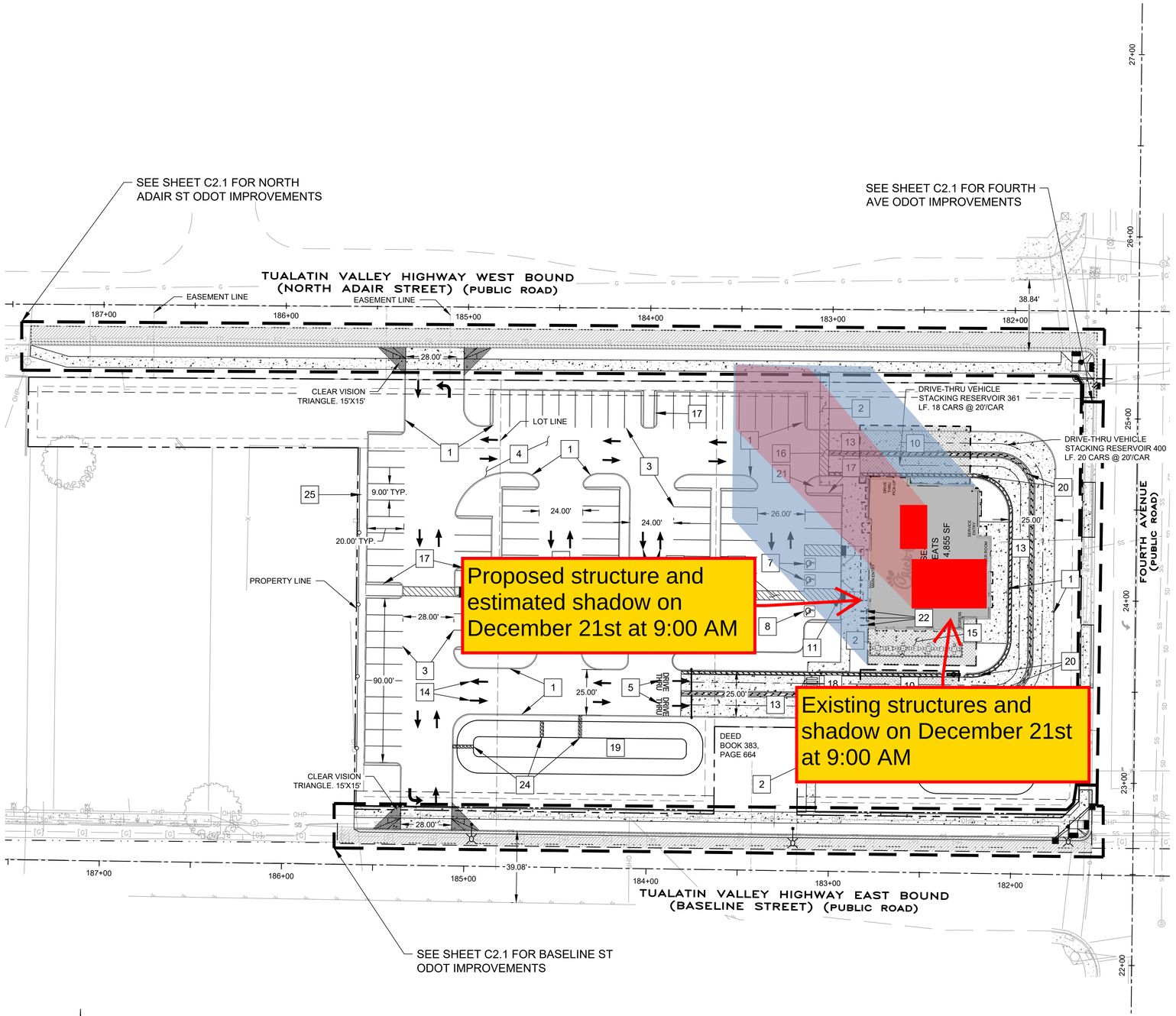
Concepts: FSR, In-Line, Licensee
Prototype: All
Palette: All

Ordering Information:

In Ground: ORN-2-IG-P
Surface Mount: ORN-2-SF-P



DESIGN	02870	BIKE RACK	05.09.18
	PST		1/1



LEGEND

- PARKING STRIPES
- ROAD STRIPING
- EXISTING FLOW LINE CURB
- EXISTING TOP OF CURB
- EDGE OF PAVEMENT
- EDGE OF CONCRETE
- PROPOSED STANDARD CURB
- W — WATER
- SD — STORM SEWER
- G — GAS
- E — ELECTRIC
- SS — SANITARY SEWER
- CENTERLINE
- RIGHT OF WAY BOUNDARY LINE
- PROPOSED PROPERTY LINE
- EASEMENT
- LOT/PARCEL LINE
- SAW CUT LINE
- PROPOSED CONCRETE
- PROPOSED LANDSCAPING
- PROPOSED ASPHALT RESTORATION
- SIGN
- TREE - DECIDUOUS
- PUBLIC SIGNAL
- STORM CATCH BASIN
- FIRE HYDRANT

[X] CONSTRUCTION NOTES

1. PROPOSED STANDARD CONCRETE CURB AND GUTTER, TYP.
2. PROPOSED STANDARD CONCRETE SIDEWALK PER ODOT DETAIL, TYP.
3. PROPOSED 4" WHITE PAINTED PARKING STRIPE, TYP.
4. PROPOSED ASPHALT PAVEMENT SURFACE.
5. PROPOSED DRIVE-THRU PAVEMENT MARKINGS.
6. PROPOSED BUILDING. REFER TO ARCHITECTURAL PLANS FOR DETAILS.
7. PROPOSED STANDARD A.D.A. STALL AND SIGNAGE.
8. PROPOSED VAN ACCESSIBLE A.D.A. STALL AND SIGNAGE.
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10. PROPOSED DRIVE-THRU CANOPY. SEE ARCHITECTURAL PLANS FOR MORE INFO.
11. PROPOSED A.D.A. RAMP, TYP.
12. PROPOSED TRASH ENCLOSURE AND STORAGE AREA WITH CONCRETE APRON. SEE ARCHITECTURAL PLANS FOR MORE INFO.
13. PROPOSED DRIVE-THRU CONCRETE.
14. PROPOSED WHITE PAINTED DIRECTIONAL ARROWS, TWO COATS MINIMUM, TYP.
15. PROPOSED COVERED CONCRETE PATIO W/ OUTDOOR TABLES & SEATING. SEE ARCHITECTURAL PLANS FOR MORE INFO.
16. PROPOSED CROSSWALK STRIPING TO BE 4" YELLOW STRIPING SPACED 2' O.C. @ 36°, TYP.
17. PROPOSED 12" LANDSCAPE AND IRRIGATION PROTECTION EXTENSION, TYP.
18. PROPOSED CROSS WALK STRIPING.
19. PROPOSED STORMWATER FACILITY. SEE SHEET C4.0 FOR MORE INFO.
20. PROPOSED DRIVE-THRU STRIPING, TYP.
21. PROPOSED FLAG POLE.
22. PROPOSED BIKE PARKING, 3 RACKS 6 STALLS TOTAL.
23. PROPOSED 2' WIDE FLOW THROUGH LANDSCAPE ISLAND
24. PROPOSED OUTFALL PROTECTION.
25. PROPOSED 6.0' TALL BLACK VINYL CHAIN-LINK DECORATIVE FENCE.

SITE PARKING STATISTICS

PROPOSED BUILDING AREA:	4,855 SF
PROPOSED OUTDOOR SEATING AREA:	1,185 SF
TOTAL:	6,040 SF
TOTAL STALLS REQUIRED:	12.4 STALLS PER 1,000 SF 75 (MAXIMUM)
TOTAL STALLS PROVIDED:	74
STANDARD STALLS	70
ADA STALLS (9'X19')	3 (1 VAN ACCESSIBLE)

N

30 0 30
SCALE IN FEET

Chick-fil-A
5200 Buffington Road
Atlanta, Georgia
30349-2998

DOWL
309 SW 6TH AVENUE, #700
Portland, Oregon 97204
971-280-8641

REGISTERED PROFESSIONAL ENGINEER
82613 PE
OREGON
JUN. 16, 1989
MICHAEL D. TOWLE
EXPIRATION DATE: 06/30/26

CHICK-FIL-A
HWY 8 & 4TH AVE
CORNELIUS, OREGON

FSR# 05889

REVISION SCHEDULE

NO.	DATE	DESCRIPTION

CIVIL'S PROJECT # 16076.01
PRINTED FOR SCHEMATIC DESIGN
DATE OCTOBER 2024
DRAWN BY EBL

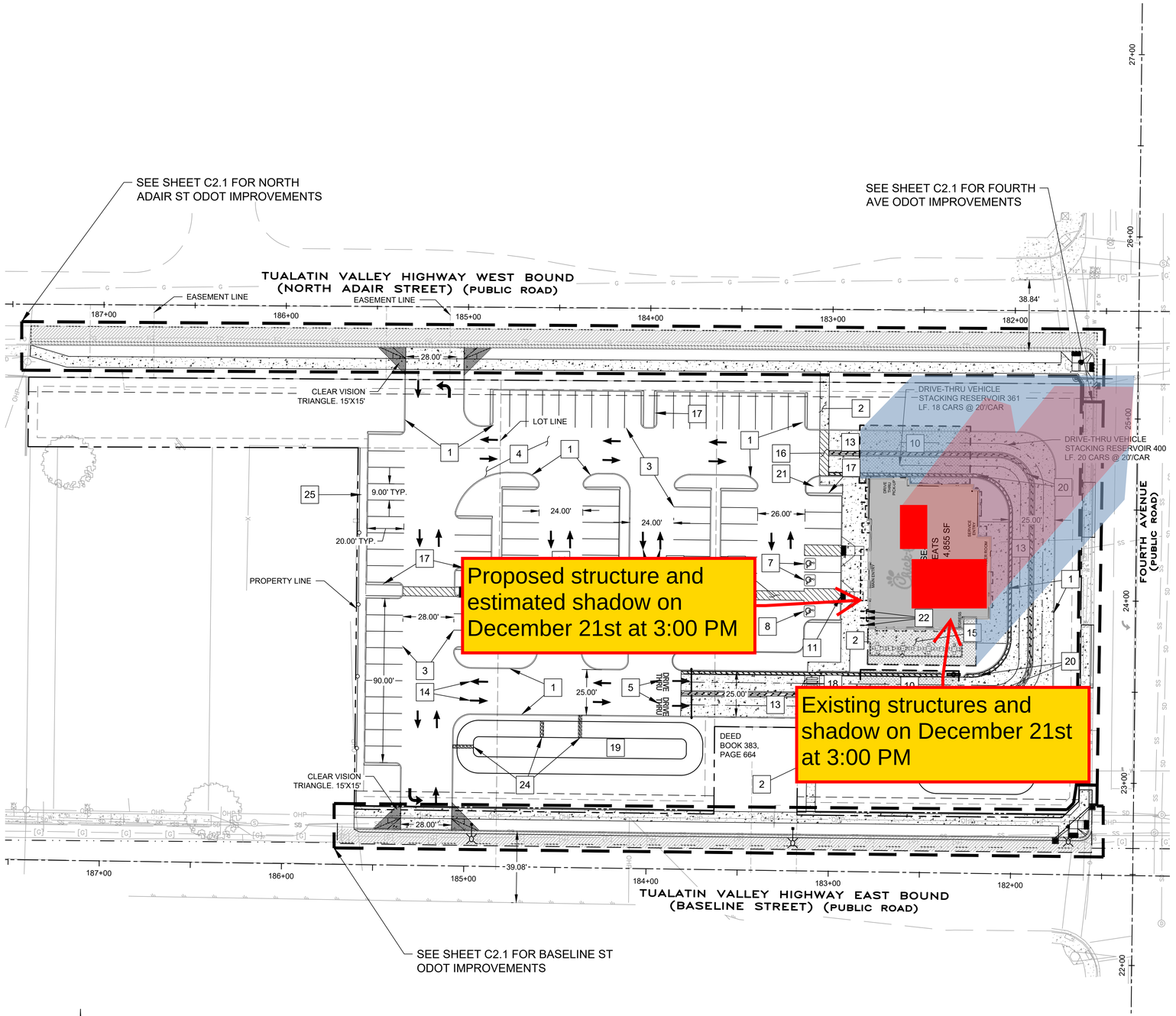
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SHEET
SITE PLAN

SHEET NUMBER
C2.0

DESIGN REVIEW

c:\dowl_pw\d0417129\SC-CS-SI-16076.dwg PLOT DATE 2024-10-4 08:53 SAVED DATE 2024-10-03 10:44 USER: elewis



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82613 PE
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MICHAEL D. TOWLE
REVIEW
EXPIRATION DATE: 06/30/26

CHICK-FIL-A
HWY 8 & 4TH AVE
CORNELIUS, OREGON

FSR# 05889

REVISION SCHEDULE

NO.	DATE	DESCRIPTION

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SHEET
SITE PLAN

SHEET NUMBER
C2.0

DESIGN REVIEW

c:\dowl_pw\d0417129\SC-CS-SI-16076.dwg PLOT DATE 2024-10-4 08:53 SAVED DATE 2024-10-03 10:44 USER: elewis

Exhibit B

Memo

Subject: Engineering Comments for the Land Use Application for Chick-fil-A at 4th-Baseline-Adair in Cornelius

Date: November 4, 2024

By: Terry, Keyes, P.E., City Engineer

These comments are based on existing conditions on the site.

The comments are based on the documents submitted for the land use application. While the comments should not be interpreted as the final engineering comments on the development, these comments attempt to cover all major public infrastructure, erosion control, and stormwater runoff requirements related to development of this site.

These comments are nearly identical to those provided at the pre-application stage of the project. The only addition from the pre-application notes addresses the sidewalk on 4th. Based on the drawings submitted for the land use application, the applicant appears to have incorporated all the comments from the pre-application notes into the plans.

General

The site consists of multiple parcels totaling 2.3 acres on the west side of 4th Avenue between Adair and Baseline.

All plans for public improvements must be designed by a registered professional engineer. Bonding for public improvements is typically required to ensure the improvements are completed in a satisfactory manner. Improvement plans for Baseline and Adair must be approved by both the City and Oregon Department of Transportation (ODOT). ODOT requires its own permits for work in their right-of-way. The timelines for ODOT review and permitting is typically longer than the city's timelines.

Street

Baseline

The frontage along Baseline is unimproved with a narrow shoulder adjacent to a road-side ditch. Overhead telecommunication lines are mounted on poles along the north side of Baseline.

Frontage improvements required by the City include:

- **Concrete curb and gutter**
- **6-foot parkway strip with street trees meeting the City's Public Works Standards. Assuming ODOT does not approve of street trees in the parkway strip, the street trees shall be placed on the north of the sidewalk on private property.**
- **6-foot concrete sidewalk**
- **Cobra-head street lights on their own poles**
- **Undergrounding all overhead lines**

- **Driveways entering Baseline shall meet the Cornelius Standard Detail for a *Commercial Driveway with a Parkway Strip (Detail S-22)* or ODOT standards**

The applicant's land use application appears to incorporate the improvements required above. The street trees proposed along all the frontages appear to be an excellent diverse selection that meets the intent of the city's Public Works Standards.

Since Baseline is State highway, ODOT may have additional requirements for frontage improvements. If the City and ODOT requirements conflict, typically the more stringent requirement prevails.

As an ODOT road, ODOT controls access to Baseline. **The applicant will need to gain permission from ODOT for the proposed access onto Baseline. Also, permits from ODOT are required for all work in their right-of-way.**

4th Avenue

The frontage along 4th is improved with a concrete curb and gutter and a 5-foot concrete curb-tight sidewalk. Two existing driveways access 4th from the site.

Cobra-head street lights are mounted on their own poles on 4th. No overhead power lines exist on the west side of the 4th.

Frontage improvements required by the City to N. 4th Avenue include:

- **Replacing the two existing driveway drops with sidewalk and a curb/gutter.**
- **Street trees on the west side of the sidewalk on private property.**

The applicant's land use application appears to incorporate the improvements required above.

A requirement not noted in the pre-application notes relates to the width of sidewalk on N. 4th. The 5-foot sidewalk is substandard for a collector street like N. 4th and should be 6-feet wide when measured from the curb face. Therefore, the applicant shall **add 6-inches to the sidewalk width on 4th to make the sidewalk 6-feet wide from the face of curb to the edge of sidewalk.** This additional 6-inches of sidewalk should fall into the existing right-of-way. If the existing street light conflicts with the expanded sidewalk, the streetlight can remain in its current location. Even with the streetlight in the sidewalk, the required 4-foot accessible pathway is easily provided.

Adair

The frontage along Adair is unimproved with a shoulder adjacent to a road-side ditch. No overhead utility lines exist on Adair. Street lights exist on the north side of Adair.

Frontage improvements required by the City include:

- **Concrete curb and gutter**
- **6-foot parkway strip with street trees meeting the City's Public Works Standards**
- **6-foot concrete sidewalk**
- **Driveways entering Baseline shall meet the Cornelius Standard Detail for a *Commercial Driveway with a Parkway Strip (Detail S-22)* or ODOT standards**

The applicant's land use application appears to incorporate the improvements required above.

Since Adair is State highway, ODOT may have additional requirements for frontage improvements. If the City and ODOT requirements conflict, typically the more stringent requirement prevails.

As an ODOT road, ODOT controls access to Adair. **The applicant will need to gain permission from ODOT for the proposed access onto Adair. Also, permits from ODOT are required for all work in their right-of-way.**

Traffic Study

The city is not requiring a traffic study for this development because the traffic volumes anticipated for this type of development are unlikely to cause any needs for mitigation measures on city streets.

Water

An 8-inch ductile iron water main exists on 4th Avenue adjacent to the site. This main meets current standards. A 12" ductile iron water main exists on Adair which meets current standards.

A 4-inch unlined cast iron water main exists along the Baseline frontage that does not meet standards.

The applicant is required to replace the substandard water main along the Baseline frontage with an 8" C900 pipe.

The applicant's land use application appears to incorporate the improvements required above. In addition, at the city's request, the applicant is proposing to extend the new 8" water main to the west to connect with the new 8" water main being installed by Hybrid HVAC. The city will reimburse the applicant for this section of water main.

A fire hydrant exists on the NW corner of 4th and Baseline. Hydrants also exist on the north side of Adair opposite the site. **The applicant Is required to install at least one new hydrant in association with the new water main on Baseline near the western edge of their project.** The fire department may require additional hydrants for the project.

The applicant's land use application incorporates the hydrant required above.

Sanitary Sewer

Public sanitary sewers exist along the Baseline frontage and on the east side of 4th. Both these sewers have capacity for the project. No public sanitary sewer improvements are required.

Stormwater

Conveyance

A public storm sewer exists on the east side of 4th Avenue. **As part of the frontage improvement on Adair and Baseline, the applicant needs to install catch basins and new storm sewers along the frontage.** The land use plans show these drainage improvements.

Treatment, Detention, and LIDA

Stormwater runoff from all new development in urban Washington County must be treated and detained in accordance with Clean Water Services (CWS) Standards. The CWS requirements consist of three parts.

1) *Treatment* – All runoff from new impervious surfaces must be treated before release into the public storm system. Treatment for commercial sites like this typically entails use of biofiltration swales, rain gardens, or stormwater filters

2) *Hydromodification or Detention* – This requirement is based on a series of factors. These factors and their ratings for this site are:

   Risk – low
   Development Class – developed area
   Project Size – large (over 80,000 sq.ft.)

   These criteria place the project in CWS's *Category 2*. Category 2 projects require significant detention as spelled out in the CWS Design and Construction Standards. Detention is typically provided by underground pipes or ponds.

3) *Low Impact Development Approach (LIDA)* – Projects must also incorporate some type of LIDA or green approach to stormwater control. Surface stormwater facilities such as swales and detention ponds meet the LIDA requirement. Other approaches that meet LIDA include: pervious pavement and green roofs.

Therefore, the project will need to meet the CWS requirements for treatment, hydromodification, and LIDA.

The applicant's land use application proposes stormwater facilities that appear adequate size to meet the CWS stormwater rules. A more detailed review of the stormwater design will occur during the construction plan review process.

Service Provider Letter (SPL)

The applicant provided an SPL for the project, as required.

Erosion Control

An erosion control plan is required for this project. Since 1 acre or more of land will be disturbed, the erosion control plan will need to meet the requirements for a 1200-CN permit and will go through City, CWS, and State Department of Environmental Quality (DEQ) review.

I have just a few comments:

1- Can we look at an access width of 28+ feet south of the dumpsters? -currently 25ft but wider would improve engine access to the entrance of the structure.

2- Hydrants need to be within 400 ft but the two existing hydrants present obstacles for effective use (one is across Adair and would block the road is used and the other is on the corner of Baseline and 4th. This second hydrant has the swell between it and the structure. I would like look at the placement of one additional hydrant.

Chad Toomey

Deputy Fire Marshal

Forest Grove Fire and Rescue

O-503.992.3196

C-971.348.9898

Exhibit C

Cornelius
Oregon's Family Town

STATE OF OREGON)
)
COUNTY OF WASHINGTON)

AFFIDAVIT OF MAILING

I, Tim Franz, being first duly sworn, depose and say:

That I served upon the persons shown on Exhibit A, attached hereto and by this reference incorporated herein, a copy of a Notice of Public Hearing, marked Exhibit B, attached hereto and by this reference incorporated herein, by mailing to them a true and correct copy of the original hereof. I further certify that said envelopes were prepared to receive postage by city staff and to be placed in the United States Mail at Cornelius, Oregon.

Dated this 14th day of, November, 2024

Signature

SUBSCRIBED AND SWORN TO before me this 14th day of November, 2024.

OFFICIAL STAMP
ELIZABETH MARIE WALEY
NOTARY PUBLIC - OREGON
COMMISSION NO. 1036240
MY COMMISSION EXPIRES APRIL 20, 2027

Notary Public for Oregon

My commission expires: April 20, 2027

TLNO	OWNERNAME	OWNERADDR	OWNERADDR2	OWNERCITY	OWNERSTATE	OWNERZIP
1S304BB00100						
1S304BB00200	KEM DEVELOPMENT INC	20449 SW TV HWY #325		ALOHA	OR	97003
1N333CC02500						
1N333CC03000						
1N333CC02600						
1N333CC02700						
1N333CC02400	HBH EQUITY LLC	5420 NW SEWELL RD		HILLSBORO	OR	97124
1N333CC02800	AJS ENTERPRISES LLC	17104 SW GREEN HERON DR		SHERWOOD	OR	97140
1N333CC03400	KB LAND DEVELOPMENT CO LLC	875 COUNTRY CLUB DR		EUGENE	OR	97401
1S304BA00601	CORNELIUS, CITY OF	1355 N BARLOW ST		CORNELIUS	OR	97113
1S304BA00500	AYRES, MARVIN V ESTATE OF	% SCHOEN, MICHAEL J & PAMELA A	PO BOX 153	CORNELIUS	OR	97113
1N333CD03600	442 WEST BASELINE LLC	3200 PARK CENTER DR STE 1240		COSTA MESA	CA	92626
1N333CC03500	SHIPMAN LIVING TRUST	PO BOX 1588		ROCKAWAY BEACH	OR	97136
1N333CC02900	KUNTZ ENTERPRISES LLC	PO BOX 329		CORNELIUS	OR	97113
1N333CC03100						
1N333CC03200	F DAVIS PROPERTIES LLC	6950 NW KANSAS CITY RD		FOREST GROVE	OR	97116
1N333CD03300						
1N333CD04400						
1N333CD03700						
1N333CD03200	522 N ADAIR LLC	7401 SW CAPITOL HWY		PORTLAND	OR	97219
1S304BA00600	SCHOEN, MICHAEL J & PAMELA A	PO BOX 153		CORNELIUS	OR	97113
1S304BB00300	LRE CORNELIUS LLC	200 E PALM VALLEY DR STE 1060		OVIEDO	FL	32765
1N333CD03100	EMMERT, TERRY W	11811 SE HWY #212		CLACKAMAS	OR	97015
1N333CC13900	WAL-MART STORES INC	ATTN PROPERTY TAX DEPT	PO BOX 8050 MS 0555	BENTONVILLE	AR	72716

Company Name	Department	Name	Address Line 1	City	State	ZIP Code
City of Cornelius			1355 N Barlow St	Cornelius	OR	97113
City of Forest Grove		Attn: Kate McGuire, Senior Planner	PO Box 326	Forest Grove	OR	97116
City of Hillsboro	Attn: City Recorder		150 E Main St	Hillsboro	OR	97123
Clean Water Services	Development Services Department	Attn: Jackie Humphreys	2550 SW Hillsboro Hwy.	Hillsboro	OR	97124
Comcast Cable Communications			11308 SW 68th Parkway	Tigard	OR	97223
Cornelius Rural Fire Protection Dist.			1355 N Barlow St	Cornelius	OR	97113
CPO 12C		c/o Joseph Auth	325 NW 334th Ave.	Hillsboro	OR	97124
CPO Coordinators		Carol Renaud	155 N 1st Ave, Suite 370 M-S 20	Hillsboro	OR	97124
Department of Economic Development			775 Summer St, NE	Salem	OR	97301
Department of Energy			550 Capitol St NE FL 1	Salem	OR	97301
DEQ			700 NE Multnomah St Ste. 600	Portland	OR	97232
Dept of Land Conservation and Development		Attn: Laura Kelly	635 Capitol Street NE, Suite 150	Salem	OR	97301
Dept of Land Use & Transportation	County Surveyors Office	Attn: Scott Young	155 N 1st Ave. Ste #350-15	Hillsboro	OR	97124
District 18 Watermaster			1400 SW Walnut St. #240, MS 49	Hillsboro	OR	97124
Evergreen Disposal & Recycling	Attn: Dawn Lucinio		PO Box 5069	Aloha	OR	97006
Forest Grove School District			1728 Main St	Forest Grove	OR	97116
Hillsboro School District		Attn: Saideh Haghughu Khochkhou	4901 SE Witch Hazel RD	Hillsboro	OR	97123
Home Builders Association		Attn: Preston Korst	15555 SW Bangy Road Suite 301	Lake Oswego	OR	97035
METRO Parks		Attn: Will Duyck, President of the Board	600 NE Grand Ave	Portland	OR	97232
Metro Regional Services	Compliance Coordinator		600 NE Grand Ave.	Portland	OR	97232
Metro Regional Services	Senior Transportation Planner	Attn: Caleb Winter	600 NE Grand Ave.	Portland	OR	97232
NW Natural Gas Company		Attn: Ileene Hyatt	250 SW Taylor St.	Portland	OR	97204
Washington Service Center	NW Regional Education Services District		5825 NE Ray Cir	Hillsboro	OR	97124
ODOT Rail Division			555 13th St. NE Suite 3	Salem	OR	97301
ODOT Region 1	Development Review Program		123 NW Flanders	Portland	OR	97209
Oregon State Dept of Fish & Wildlife			4034 Fairview Industrial Dr SE	Salem	OR	97302
Oregon State Division of State Lands			775 Summer Street NE	Salem	OR	97301
Port of Portland			P.O. Box 3529	Portland	OR	97208
Portland & Western Railroad, Inc.			1200 Howard Dr SE	Albany	OR	97321
Portland General Electric		Attn: Grant Howell	121 SW Salmon St	Portland	OR	97204
Portland General Electric			121 SW Salmon St	Portland	OR	97204
Tri-Met			4012 SE 17th Ave	Portland	OR	97202
Tualatin Soil and Water Conservation District			7175 NE Evergreen Pkwy, #400	Hillsboro	OR	97124
Tualatin Valley Irrigation Dist			2330 Elm St	Forest Grove	OR	97116
US Army Corps of Engineers			P.O. Box 2946	Portland	OR	97208
USPS		Attn: Post Master	1330 SW Walnut Street	Hillsboro	OR	97123
Washington County	Assessment and Taxation Dept.		155 N 1st Ave	Hillsboro	OR	97124
Washington County	Enhanced Sheriff's Patrol Dist.		215 SW Adams Ave., MS-32	Hillsboro	OR	97123
Washington County	Health & Human Services		155 N 1st Ave, Ste. 170 MS-23	Hillsboro	OR	97124
Washington County	Housing Authority		161 NW Adams Ave, Suite 2000 MS 63	Hillsboro	OR	97124
Washington County	Mosquito Control	Attn: Kenny Carver	155 N 1st Ave, Ste. 170 MS-5	Hillsboro	OR	97123
Washington County Land Use & Transportation	Urban Road Maintenance District	Attn: Tony Mills	1400 SW Walnut St. #241	Hillsboro	OR	97123
Washington County Land Use & Transportation	Planning Division	Attn: Paul Schaeffer, Senior Planner	155 N 1st Ave. Ste#350 MS 14	Hillsboro	OR	97124
Washington County Land Use & Transportation	Planning & Development Services	Attn: Principal Planner	155 N 1st Ave. Ste. 350, MS 14	Hillsboro	OR	97124
WCCCA 9-1-1	Data Services	Attn: Ian Crawford	5900 NE Pinefarm Ct	Hillsboro	OR	97124
Ziply Fiber			4155 SW Cedar Hills Blvd	Beaverton	OR	97005
MCI Metro Access Transmission Services Corp	Undeliverable	Notice Return on 2/3/2024, 3/2/2024, 3/6/2024	2250 NE Aloclek Dr	Hillsboro	OR	97124

Cornelius
Oregon's Family Town

NOTICE IS HEREBY GIVEN that a Public Hearing will be held before the City of Cornelius Planning Commission on Tuesday, **December 10, 2024, at 7:00 pm.** The meeting will be held in-person at Cornelius City Hall, 1355 N Barlow Street, in the City Council Chambers and remotely via the Zoom platform, as noted on page 3.

Case File No. DR-74-24 & LP-04-24

APPLICANT: Austin Cross – 4G Development and Consulting Inc.
Owner: HBH Equity LLC
LOCATION: 300 Baseline Street; 316 Baseline Street & 47 N 4th Avenue.

PROPOSAL: A Type III Site Design Review (DR-74-24) and Preliminary Land Partition 'One-Lot Land Partition' (LP-04-24) to redevelop a commercially zoned property for a new 4,855 SF Chick-fil-A restaurant. The new development will include a new parking lot, landscaping, vehicle drive-thru lanes and other supporting amenities. The application also includes a preliminary land partition plat, to legally redescribe five existing tax lots into one new lot.

LEGAL: T 01 N, R 03 W, Map 33CC, Tax lot# 2400, 2500, 2600, 2700 & 3000.
ZONING: Highway Commercial, C-2

REVIEW CRITERIA: Chapters 18.10 & 18.15 (Application & Review Procedures); Chapter 17.05.030 (Land Partitioning); Chapter 18.45 (Highway Commercial, C-2); Chapter 18.100 (Site Design Review); Chapter 18.145 (Off-Street Parking and Loading) and Chapter 18.155 (Solar Access for New Development)

Order of Planning Commission Proceedings: At the public hearing, the Planning Commission Chair will open the public hearing, a staff report will be presented, the applicant will be given the opportunity to make a presentation, interested persons will be called on to speak for or against the proposal, Commissioners will ask questions, the applicant will be given the opportunity to rebut testimony, staff will be given the opportunity to provide closing remarks, and the public hearing will be closed. At that point, all testimony is complete and the Planning Commission will deliberate on the facts and findings in the

staff report and testimony. The Planning Commission will make a decision. The Planning Commission may set a maximum time allowance of 3 or 5 minutes per testifier.

Written Testimony: To submit written testimony prior to the hearing please send it as 'testimony' via email to Community.Development@corneliusor.gov. Testimony received prior to 8:00 am on the day of the hearing will be posted to the agenda packet online. Testimony received after 8:00 am on the day of the hearing will be forwarded to the Planning Commission and will be made part of the record. To accept the testimony, it will need your name, address, and the Case File No. **DR-74-24 & LP-04-24** when providing testimony so that the City can send the Notice of Decision to you along with appeal rights.

In-Person Testimony: To testify in-person fill out a yellow comment card. Be sure to note your name, address, and the Case File No. **DR-74-24 & LP-04-24**. The Planning Commission Chair will call on participants who have submitted a yellow card in the order received.

Virtual Testimony: To testify virtually, pre-register by providing your name, address, Zoom account name, and Case File No. **DR-74-24 & LP-04-24** by email to Community.Development@corneliusor.gov prior to 5:00 pm on the day of the hearing. Your information will not be shared at the hearing. At the hearing, the Planning Commission Chair will call on participants who pre-registered. If unable to pre-register prior to the hearing, email Community.Development@corneliusor.gov during the hearing to request to speak; include your name, address, Zoom account name, and the Case File No. **DR-74-24 & LP-04-24** in your email. Virtual participants will not be able to share their screen during the meeting; presentation materials should be submitted to Community.Development@corneliusor.gov as written testimony by 5:00 pm on the day of the hearing.

Testimony Guidelines: Testimony should avoid repetition of issues and should be based on the application criteria. Oregon Revised Statutes (ORS) 197.797 provides that under certain circumstances, the record may remain open, or a continuance may be granted, upon the request of a participant. Telephone conversations are not accepted as testimony.

Pursuant to ORS 197.797, failure to raise an issue at the final evidentiary hearing or by the close of the record (in-person, virtually, or by letter), or failure to provide statements or evidence sufficient to afford the decision maker an opportunity to respond to the issue, precludes appeal to the Land Use Board of Appeals based on that issue.

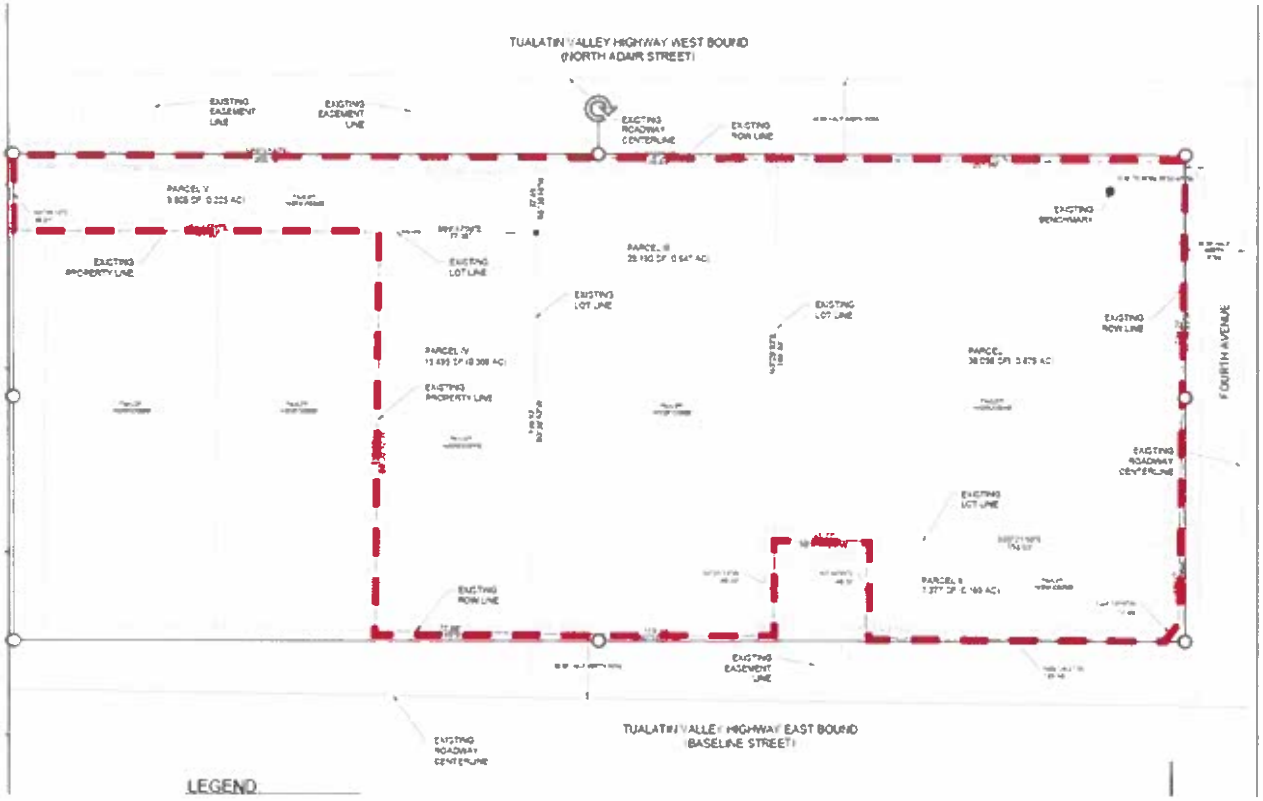
For more information on the application, contact: Tim Franz, Senior Planner, at 503 357-3011 or by email at tim.franz@corneliusor.gov.

Join us
In-Person at the City Council Chambers at 1355 N Barlow Street;
Virtually at Zoom.us/Join **Meeting ID: 883 0240 3397** and **Passcode: 462062.**

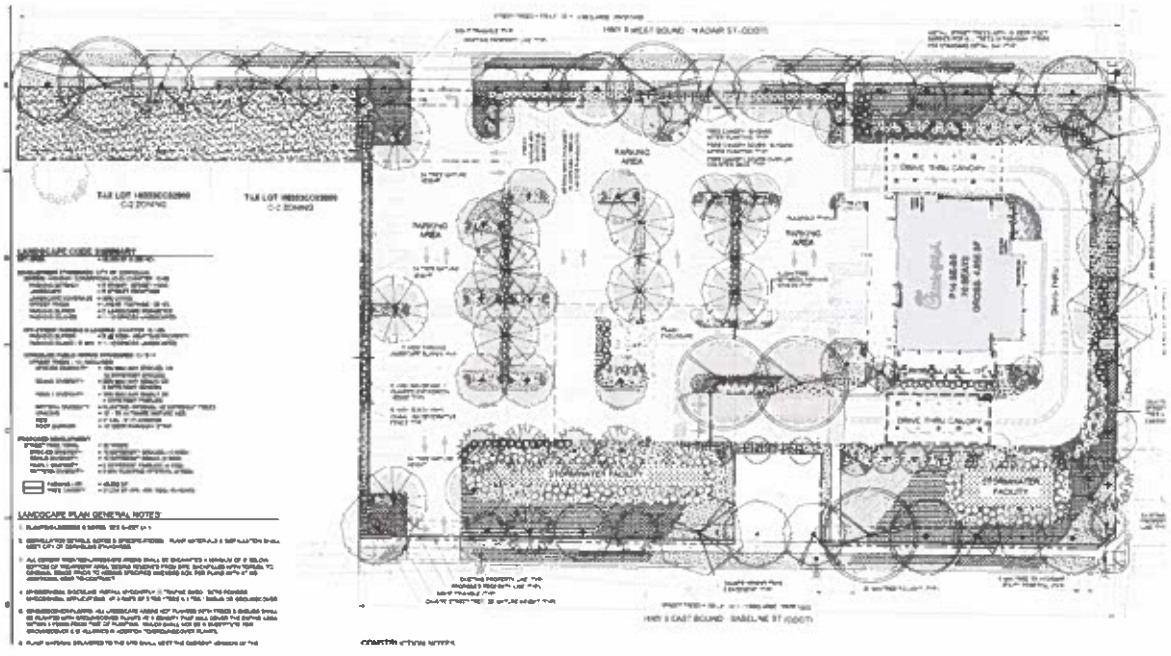
You can also call in to listen to the meeting by dialing 1-253-215-8782.



Location of the project



Subject Site



Proposed site plan with landscaping

Exhibit D

From:	Austin Cross
To:	Tim Franz
Cc:	Andrew Hunt; Nathan Lodico
Subject:	FW: Hwy 8 and 4th Fire Department comments/concerns
Date:	Wednesday, December 4, 2024 10:54:28 AM
Attachments:	Fire Truck Turning Exhibit-FT.pdf

Tim,

Regarding condition #8, please see Chad's approval for engine access. We will request this condition be removed at the commission hearing.

Best,

Austin Cross – Project Engineer
4G DEVELOPMENT AND CONSULTING, INC.
P.O. Box 270571, San Diego, CA 92198
P (916) 817-7587

From: Chad Toomey <ctoomey@forestgrove-or.gov>
Sent: Thursday, November 21, 2024 9:35 AM
To: Austin Cross <across@4Gdev.com>
Subject: RE: Hwy 8 and 4th Fire Department comments/concerns

Thanks Austin. It does look like it will work.

Chad Toomey
Deputy Fire Marshal
Forest Grove Fire and Rescue
O-503.992.3196
C-971.348.9898

From: Austin Cross <across@4Gdev.com>
Sent: Friday, November 15, 2024 4:43 PM
To: Chad Toomey <ctoomey@forestgrove-or.gov>
Cc: Andrew Hunt <ahunt@4Gdev.com>; Mike Towle <mtowle@dowl.com>; 'Drew Rommel' <drommel@dowl.com>; Nathan Lodico <nlodico@4Gdev.com>
Subject: RE: Hwy 8 and 4th Fire Department comments/concerns

Hello Chad,

Did you have a chance to look at this exhibit?

Best,

Austin Cross – Project Engineer
4G DEVELOPMENT AND CONSULTING, INC.
P.O. Box 270571, San Diego, CA 92198

P (916) 817-7587

From: Austin Cross
Sent: Tuesday, November 5, 2024 12:39 PM
To: 'Chad Toomey' <ctoomey@forestgrove-or.gov>
Cc: Andrew Hunt <ahunt@4Gdev.com>; mtowle@dowl.com; 'Drew Rommel' <drommel@dowl.com>
Subject: RE: Fire Department comments/concerns

Hello Chad,

We ran a truck turning exhibit and it looks like the current site plan provides good fire truck movement to get to the building. Let me know when you reviewed the exhibit and if we should still pursue alternate dimensions.

Best,

Austin Cross – Project Engineer
4G DEVELOPMENT AND CONSULTING, INC.
P.O. Box 270571, San Diego, CA 92198
P (916) 817-7587

From: Chad Toomey <ctoomey@forestgrove-or.gov>
Sent: Tuesday, November 5, 2024 10:49 AM
To: Austin Cross <across@4Gdev.com>
Subject: RE: Fire Department comments/concerns

Austin,

I just drove that stretch of road and now see an additional hydrant so I don't think we need to add private hydrants. The only other concern is the ability for an engine to make an effective turn off of the east bound access point and to the structure. When you get a chance lets talk about the dimensions of the parking lot

Chad Toomey
Deputy Fire Marshal
Forest Grove Fire and Rescue
O-503.992.3196
C-971.348.9898

From: Austin Cross <across@4Gdev.com>
Sent: Friday, November 1, 2024 8:59 AM
To: Tim Franz <Tim.Franz@corneliusor.gov>
Cc: Chad Toomey <ctoomey@forestgrove-or.gov>; Andrew Hunt <ahunt@4Gdev.com>
Subject: RE: Fire Department comments/concerns

Tim,

Thanks for sending this over. I sent this to our civil team so we can take a look at addressing the comments.

Best,

Austin Cross – Project Engineer
4G DEVELOPMENT AND CONSULTING, INC.
P.O. Box 270571, San Diego, CA 92198
P (916) 817-7587

From: Tim Franz <Tim.Franz@corneliusor.gov>
Sent: Thursday, October 31, 2024 3:36 PM
To: Austin Cross <across@4Gdev.com>
Cc: Chad Toomey <ctoomey@forestgrove-or.gov>
Subject: Fire Department comments/concerns

Hi Austin,

Chad Toomey, Deputy Fire Marshal sent me to following comments/concerns, below. I'm forwarding them for your review/response.

I have just a few comments:

1- Can we look at an access width of 28+ feet south of the dumpsters? -currently 25ft but wider would improve engine access to the entrance of the structure.

2- Hydrants need to be within 400 ft but the two existing hydrants present obstacles for effective use (one is across Adair and would block the road is used and the other is on the corner of Baseline and 4th. This second hydrant has the swell between it and the structure. I would like look at the placement of one additional hydrant.

Chad Toomey
Deputy Fire Marshal
Forest Grove Fire and Rescue
O-503.992.3196
C-971.348.9898

Please let us know if you have any questions.

Thanks,

Tim Franz, Senior Planner
City of Cornelius
Community Development
1300 S. Kodiak Circle
Mailing: 1355 N. Barlow Street
Cornelius, OR 97113

Phone: (503) 357-3011

TUALATIN VALLEY HIGHWAY WEST BOUND
(NORTH ADAIR STREET) (PUBLIC ROAD)

FOURTH AVENUE
(PUBLIC ROAD)

32.00'

25.00'

24.00'

25.00'

28.00'

DRIVE THRU

DRIVE THRU

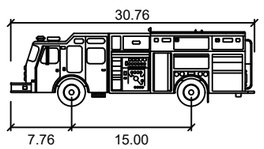
P14 SE-BS
70 SEATS
GROSS: 4,855 SF

COH Hillsboro Pumper
city - fire & rescue (GREEN)

TUALATIN VALLEY HIGHWAY EAST BOUND
(BASELINE STREET) (PUBLIC ROAD)

N

50 0 50
SCALE IN FEET



COH Hillsboro Pumper	feet
Width	: 8.25
Track	: 8.00
Lock to Lock Time	: 6.0
Steering Angle	: 35.9

DOWL
WWW.DOWL.COM

CHICK-FIL-A CORNELIUS
FIRE TRUCK TURNING EXHIBIT
CORNELIUS, OREGON

PROJECT	16076
DATE	11/05/2024

FIG. 1

C:\dowl_pwd\041619\2\Fire Truck Turning Exhibit.dwg PLOT DATE 2024-11-5 12:10 SAVED DATE 2024-11-05 11:23 USER: dcommel

DR-74-24 and LP-04-24 Condition of Approval Requested Changes

Prior to Building Permit Submittal

4. The applicant shall submit their public improvement plans to be reviewed and approved by the City Engineer. The applicant is requesting this condition be moved to "Prior to Building Permit Issuance".

5. The applicant shall submit a final design of the utilities to the City Engineer for review and approval. The applicant is requesting this condition be moved to "Prior to Building Permit Issuance".

7. The existing billboard shall be removed from the site. The applicant is requesting this condition be moved to "Prior to Building Permit Issuance".

8. ~~The applicant shall contact the Deputy Fire Marshal, to discuss access width, south of the trash enclosure. If necessary, a revised site plan shall be submitted to the Community Development Department for review and approval.~~ The applicant confirmed with fire marshal Chad Toomey that our proposed plan provides sufficient fire truck access. Therefore the applicant is requesting this condition to be removed.

Prior to Building Permit Issuance

36. Pedestrian pathways, where they cross the drive-thru and drive-aisles, shall be ~~raised and~~ striped, meeting all applicable ADA requirements. In addition, pathways shall be lit to provide visibility during nighttime hours. Crosswalk signage shall be provided for pedestrian and driver safety at corresponding ramps crossing the drive-through.

